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An economic analysis of the aeromedical evacuation, patient movement items program

Spratt, Scott M.

Monterey, California: Naval Postgraduate School

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AN ECONOMIC ANALYSIS OF THE AEROMEDICAL EVACUATION, PATIENT MOVEMENT ITEMS PROGRAM

by

Scott M. Spratt

December 1999

Principal Advisor:	William R. Gates
Associate Advisor:	Kevin R. Gue

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This thesis illustrates that initial deferment can generate substantial savings. This thesis recommends increasing readiness capabilities and cost avoidance by implementing the deferment plan.

This thesis recommends additional areas of further research to include consolidating patient movement and inventory tracking systems and utilizing advanced simulation software to determine medical requirements in theaters of operation. These initiatives, if analyzed more thoroughly, could provide DoD policy makers clearer insight for potential system-wide savings.

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AN ECONOMIC ANALYSIS OF THE AEROMEDICAL EVACUATION, PATIENT MOVEMENT ITEMS PROGRAM

Scott M. Spratt
Lieutenant, United States Navy
B.S., Park College, 1989
MHA, Chapman University, 1995

Submitted in partial fulfillment of the
requirements for the degree of

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from the

NAVAL POSTGRADUATE SCHOOL
December 1999

Author: [redacted]

Scott M. Spratt

Approved by: [redacted]

William R. Gates, Principal Advisor

[redacted]

Kevin R. Gue, Associate Advisor

[redacted]

Reuben T. Harris, Chairman,
Department of Systems Management

ABSTRACT

This research examines the Air Force Aeromedical Evacuation, Patient Movement Items (PMI) Program. This thesis analyzes the primary question of cost savings or equipment deferment based on projected casualty rates. It uses a simple linear program, focused on minimizing beginning inventory, and maps an optimal order plan based on manufacturer capacity and lead time. This thesis suggest updating demand requirements for variability from projected demand using an exponentially weighted moving average calculation.

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I. INTRODUCTION

This research examines the Air Force Aeromedical Evacuation, Patient Movement Items (PMI) Program. Projected PMI equipment requirements will be evaluated with order lead times and manufacturer's production capacity to determine minimal equipment requirements. Given that demand can accurately be forecasted and that a Department of Defense (DOD) standardization program is implemented throughout the services for PMI equipment, DOD should be able to establish contracts with incentive pricing that encourage vendor participation and reduce costs or defer procurement requirements. The goal is to review potential PMI equipment cost savings or deferred procurement options and illustrate these through a cost benefit analysis. This will help define a viable Distribution Resource Plan to more efficiently deploy Aeromedical PMI assets through increased vendor involvement.

A. BACKGROUND

"The wartime planning requirement for medical care has declined since the end of the Cold War, decreasing the forward medical presence dictates that theater commanders will be more dependent on the Aeromedical Evacuation System (AES) linking casualties to life-saving medical care."[1]

Patient Movement Items (PMI) are life-saving supplies and equipment that stabilize a patient during aeromedical evacuation (AE). The Aeromedical

[1] (The Aeromedical Evacuation system Roles and Responsibilities; October 1997, p. 2).

Evacuation System (AES) uses PMI, sent with the patient from transferring medical facility, to sustain care during medivac. The PMI remains with the patient until final discharge from a CONUS or OCONUS healthcare facility. The PMI Program was conceived to prevent the capabilities of medical elements from degrading due to an outflow of PMI equipment with medivac patients. The program's main focus is to manage all PMI assets and provide in-kind exchange to the transferring healthcare facility, whether a Fleet Hospital, Beach Evacuation Station, or Hospital Ship, for those patients requiring intervention during aeromedical evacuation.

The PMI program is tasked with procurement, inventory, warehousing, maintenance and transport of all PMI items to the theater of operation during regional or global conflicts. This task becomes more complex as budgetary reductions occur each year, personnel end strength is reduced, and depot level medical inventories are no longer maintained. A serious concern of the PMI program is product standardization and "state-of-the art" technology to ensure casualties receive the most advanced life support equipment available.

According to the Joint Medical Logistics (JML) 2010 Document, "military medicine drives very few unique items of equipment or supply, but the process for identifying and capitalizing on the capabilities of the vast U.S. healthcare marketplace have been inadequate."[2] JML 2010 proposes that information about

[2] (Defibaugh/Miller, 1999).

products and equipment in regular, frequent use throughout the DOD healthcare system be gathered and used to shape the requirements for wartime use.

Medical technology is a key factor facing PMI managers as they plan long term supportability and negotiate contracts to support requirements for PMI pre-war inventories. Technology within the medical arena is currently evolving at such an astonishing rate that military leaders fear manufacturers are unable to keep medical equipment production at an effective level to support military surge requirements. The best solution then, is to select the most effective product, standardize usage across all services and develop an integrated supply chain with the associated PMI equipment manufacturers. In other words, design a comprehensive Distribution Resource Plan (DRP) that provides full information so that the manufacturers can adjust their production rates or Material Requirements Plans (MRP) to meet DOD contingencies as well as peacetime AE commitments.

B. RESEARCH QUESTIONS

This thesis analyzes the primary question of cost savings or equipment deferment based on projected casualty rates and diagnosis using a simple linear program, focused on minimizing beginning inventory and mapping an optimal order plan based on manufacturer capacity and lead time.

Can the cost of readiness within the Aeromedical Evacuation System, Patient Movement Items Program, be reduced, by either direct savings or procurement deferral?

1. What are the risks to the Aeromedical Evacuation System if PMI equipment is deferred?

2. What are the cost differences between the current strategy and a deferred strategy?

3. Is the forecasted equipment requirement related to the number of dedicated AE lift assets?

4. What determines PMI equipment as necessary technology in aero-medical patient care?

C. METHODOLOGY

This research investigates the unique factors that define the AE system and the PMI Program.. This thesis provides a means to cost savings measures by applying linear programming models for known demand over a sixty day period constrained by manufacturer production capacity and order lead time. The challenges are to determine:

- Manufacturer production capabilities to meet surge requirements by either phased or lumpy distributions.
- Compliance with DoD/DoN contracting methods.
- Accurate equipment and technological requirements to deliver acute trauma care in an aeromedical evacuation environment.

D. SCOPE

In examining PMI cost savings, this thesis will focus on the following:

- Review all pertinent PMI Program charter plans, the Joint Medical Logistics 2010 Directives and PMI material requirements during peacetime and wartime scenarios.
- Review the industrial base production capabilities to meet contingency efforts.

- Interview leaders within the Navy, Army and Air Force Medical Services, as well as key PMI Program Officials to understand and gather data on AE and PMI.

Based on these in-depth reviews, this thesis will offer recommendations to reduce the potential costs and risks involved in the current AES, PMI process by illustrating cost saving/deferment methods that maintain or exceed readiness standards.

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II. AEROMEDICAL EVACUATION PROCESS

This chapter examines the Aeromedical Evacuation System (AES), through the five echelons of medical care. It reviews the mission of the Aeromedical Evacuation System; Theater Evacuation Policy; Echelons of Patient Care, where maximum capabilities of each are based on patient condition; patient evacuation priority categories; and the staging process for AE assets necessary for contingency patient evacuation from Echelon III through Echelon IV. Finally, it outlines the Patient Movement Items (PMI) process and specific equipment items which make up the PMI inventory.

A. PRIMARY MISSION

> **The mission of the worldwide Aeromedical Evacuation System is to transport casualties by air, under medical supervision, from forward airfields in the combat zone to points of definitive medical care in the communications zone (COMMZ), (intratheater or intertheater depending on the theater), and from the communications zone to CONUS (intertheater), or to an intermediate supporting theater (intertheater). The U.S. Air Force fixed wing common user aircraft will normally operate to evacuate casualties from Echelon III to Echelon IV medical facilities (combat zone to communications zone) or from Echelon IV to Echelon V medical facilities (communications zone to CONUS). Capability to evacuate patients from Echelon II rearward exists, but is dependent upon the operational situation. Other aircraft used for AE routinely operate in support of common user transportation requirements or other comparable elements for air traffic control."[3]**

[3] (ANNEX Q to AMC Omnibus OPLAN (U); (OPR; SGX)).

Figure 1 depicts patient movement through the five Echelons of patient care and outlines the AE evacuation and staging units established within the theater of operation.[4]

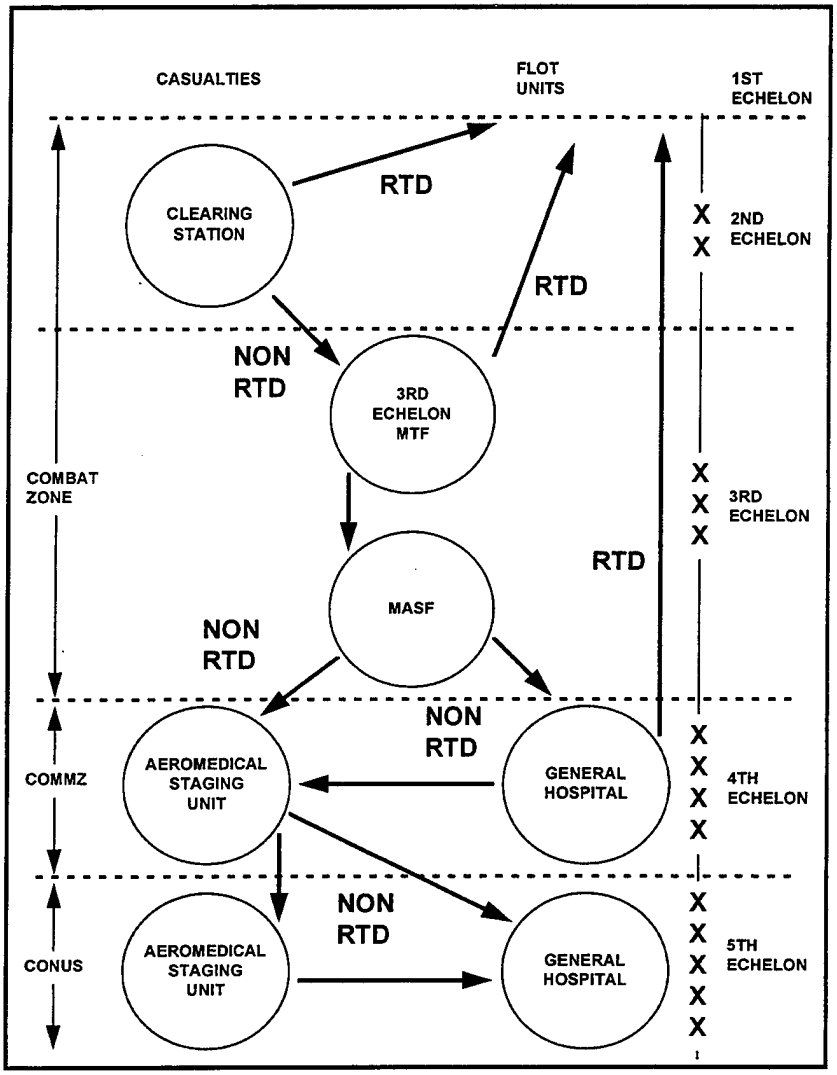

Figure 1. Patient Movement Interfaces

[4] (Joint Pub 4-02.2; 30 December 1996, p. I-1-I-3).

B. THEATER EVACUATION POLICY

The theater evacuation policy is the driving force for determining the number of patients to be evacuated and guides physicians about when they should consider evacuating patients to another echelon of care.[5] Figure 2 details the five echelons of care and the level of patient treatment provided by each. Figure 3 lists the evacuation priority classification with expected evacuation times.

ECHELON I	Care rendered at the unit level. Sometimes referred to as "Buddy Aide." At this level of care there may be one General Medical Officer assigned or Physicians Assistant (PA) who may maintain an Aide Station. The care received from this echelon of care is non-life threatening or emergency life saving measures such as maintenance of an airway, control bleeding, control shock and prevention of further injury. The elements of medical care available at this level is sufficient to either return patients to full duty or prepare them for evacuation to a higher echelon.
ECHELON II	"As a minimum, Echelon 2 care includes basic resuscitation and stabilization and may include limited surgical capability, basic laboratory, pharmacy and temporary holding facilities. Surface or air evacuation to a medical treatment facility (MTF) would be utilized for patients who require more comprehensive treatment."[6]
ECHELON III	Care administered at this echelon requires clinical capabilities that are normally found in an MTF staffed, equipped and located in a lower level threat area. At this echelon we may witness the first step toward restoration of functional health rather than only those procedures involved in stabilizing a condition or prolonging life. Due to advanced outfitting and staffing, healthcare providers at Echelon 3 may proceed with greater deliberation when assessing patient care.
ECHELON IV	Care provided in a Medical Treatment Facility that is staffed and equipped for definitive care. This echelon includes specialized surgical capabilities.
ECHELON V	Convalescent, restorative or rehabilitative care that is provided by a CONUS based MTF such as a military hospital, Department of Veterans Affairs Hospital or Civilian Hospitals.

Figure 2. Echelons of Care

[5] (ANNEX Q to AMC OMNIBUS OPLAN (Q) (QPR:SGX)).

[6] (Joint Pub 4-02.2, "Joint Tactics, Techniques, and Procedures for Patient Movement in Joint Operations, 30 December 1996, p. I-3-I-5).

CATEGORY	ARMY	NAVY	MARINE CORPS	AIR FORCE
URGENT	Within 2 Hours	Within 2 Hours	Within 2 Hours	As Soon As Possible
PRIORITY	Within 4 Hours	Within 4 Hours	Within 4 Hours	Within 24 Hours
ROUTINE	Within 24 Hours	Within 24 Hours	Within 24 Hours	Within 72 Hours

Figure 3. Evacuation Priority Classifications

The number of definitive care beds available within the theater, relative to actual or estimated casualties, is the primary determinant in establishing evacuation policy. The evacuation policy is established by the theater commander, based on advice from the theater surgeon. The policy states the maximum period of non-effectiveness, in number of days, that casualties may be held within the theater for treatment. This does not imply that a casualty must be held in theater for the entire period of the theater evacuation policy. Casualties not expected to return to duty within the number of days expressed in the theater evacuation policy are evacuated as soon as both medical conditions permit and transportation can be arranged.[7]

The Aeromedical Evacuation System needs the capability to move casualties to forward treatment areas from theater areas within hours of being stabilized. This requires that the level of care at an intra-theater staging point must be equal to the level of care available during inter-theater aeromedical evacuation.

[7] (ANNEX Q AMC OMINBUS OPLAN(Q) (QPR:SGX)).

This typically means having the ability to continue basic life support (BLS) through advanced life support (ALS) during transport operations.

C. AEROMEDICAL EVACUATION SUPPORT UNITS

The operations element to support the Aeromedical Evacuation System relies heavily upon support and logistics requirements. There are distinct AE Unit Type Code (UTC) Teams that are deployed to support the theater commander's evacuation policy. These teams provide operational reporting and other pertinent data to theater AE commands. Teams may also be required to assume an inter-theater mission responsibility in selected situations. Thus, their support for contingency operations is not restricted to the intra-theater mission. The following designated UTC teams support theater evacuation at the Echelon II, III and IV levels. This thesis is concerned with the activities and material requirements for Echelons III through V, but it is important to understand the significance of each team unit and the capabilities they possess. Figure 1 above illustrates the interaction between each echelon of medical care.

1. Aeromedical Evacuation Operations Team (AEOT)

An Aeromedical Evacuation Operations team is comprised of a 32 person UTC with the ability to assume management and support responsibilities for other AE elements operating in the vicinity. AEOTs are deployed to AE strategic interface airfields to support intra-theater Air Force missions, and provide launch, recovery and mission management for AE missions, AE crews and related AE

equipment. These teams have a dual intra/intertheater support responsibility. The specific responsibilities assigned to these units include: AE crew management, AE mission support and AE equipment management, including patient movement items (PMI).[8]

2. Mobile Aeromedical Staging Facilities (MASF)

The MASF is a 39 person, mobile, tented, temporary staging facility that supports casualty care and administration. Each MASF can routinely hold and process 50 patients at any given time, but is not intended to hold casualties overnight or for any extended period. A MASF is capable of cycling its patient load four times within a twenty-four hour period, to handle up to 200 patients per day. Each MASF deploys with sufficient supplies and medical equipment to sustain itself for five days with a fifteen day re-supply, providing a twenty day sustainment capability. Longer deployments require additional re-supply requirements.

MASF's are neither staffed nor equipped to perform certain care functions. As a result, originating medical facilities must provide transportation to evacuate casualties to and from the MASF, including providing the patient litter and/or any special medical equipment required for patient flight. The MASF is located near runways or taxiways of an airfield or forward operating base that is used by intra-theater airlift aircraft to re-supply combat forces. The MASF does not have any

[8] Ibid.

organic beds; when patients arrive on a litter, the litter becomes the staging and evacuation bed.[9]

3. Aeromedical Evacuation Air Crew

Aeromedical evacuation air crews consist of two flight nurses and three aeromedical evacuation technicians. The crew to patient ratio planning factor is 1:10. The AE crew provides in-flight medical care aboard configured evacuation aircraft, controls and monitors patient on-loading/off-loading, and ensures the aircraft is properly configured to support patient transport. Non-flight surgeon physicians and other medical personnel are added to the aeromedical evacuation crew as patient conditions warrant.[10]

4. Aeromedical Staging Squadrons (ASTS)

An ASTS is a 100 to 250 bed medical facility located on or near an airbase or airstrip. Normally, the staging units are designated for inter-theater aeromedical evacuation interface. The ASTS is not readily mobile, like the MASF; it maintains its own organic beds and is capable of holding patients for longer periods of time. The ASTS manning composition includes physicians, unlike the MASF. The ASTS's primary responsibilities include:

- Patient Reception.
- Administrative Processing.

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[9] Ibid.

[10] Ibid.

- Ground Transportation.
- Food.
- Limited care for patients entering, en route, or leaving the AE system.

An ASTS may be deployed to support casualty needs in 50, 100, 200 or 250 bed contingency configurations.[11]

D. AIRLIFT

Airlift is the cornerstone of the aeromedical evacuation system. The capacity of evacuation aircraft determines the number of evacuees airlifted from an Echelon III treatment area to the next higher echelon for care. Since AMC is the single aeromedical evacuation lead command for the Air Force, dedicated, designated or lift of opportunity is provided from current Air Force inventory. In extreme contingency operations, when available Air Force assets are insufficient, the President may order the Civil Reserve Air Fleet to duty. These aircraft are commercial planes re-configured to accommodate patient transport.[12]

Currently there are three types of military aircraft assigned to aeromedical evacuation:

- **C-9A NIGHTINGALE**: The C-9A is the Air Force's only aircraft designed specifically for aeromedical evacuation. It has a range in excess of 2300 miles and is powered by twin aft mounted jet engines. To aide in on-loading/off-loading patients, the C-9A is

[11] Ibid.

[12] Ibid.

equipped with a folding ramp. The C-9A is also outfitted with both central oxygen and suction outlets throughout the cabin.[13] The transport capabilities include 40 litter patients, 40 ambulatory patients or a combination of 15 litter and 24 ambulatory patients.[14] One aircrew, consisting of a flight nurse and two AE technicians, is assigned to support the AE operation. The Air Force C-9A inventory consists of 15 aircraft. They are at three strategic locations: Scott AFB, IL (9); Yakota AFB, Japan (3); and Ramstein AFB, Germany (3). This airframe is scheduled for replacement in the year 2006. So far there is no replacement airframe identified. The C-17 is currently being considered.

- **C-130 HERCULES**: is a long range, high wing, four turbo prop engine aircraft, predominately used for intra-theater (tactical) rather than inter-theater (strategic) evacuation. The C-130 can be readily configured for aeromedical evacuation by using seat and litter provisions stowed in the cargo compartment. The aircraft is designated rather than dedicated to support AE operations.[15] The maximum patient evacuation capacity for the C-130 is 74 litters, 85 ambulatory or a combination of 50 litter and 27 ambulatory patients.[16] This aircraft poses several problems which make patient evacuation difficult, including cabin noise and inadequate lighting to many patient care areas. The C-130 also lacks central patient oxygen and suction systems. A supplemental self-contained oxygen system must be installed when evacuees require therapeutic oxygen during transport. Finally, the lavatory is located at the base of the cargo ramp, which makes access for patients nearly impossible.[17]

- **Civil Reserve Air Fleet (CRAF):** CRAF airlift is dedicated for AE operations, but is employed only during extreme contingency operations, when Air Force AE aircraft are insufficient. CRAF is activated by presidential order. When the Civil Reserve Air Fleet is activated, the B-767 series 200/300 is the dedicated airframe for AE operations. This commercial aircraft is reconfigured for AE

[13] Ibid.

[14] (Joint Pub 4-02.2, 30 December 1996).

[15] (ANNEX Q to AMC OPLAN (Q) (QPR;SGX).

[16] (Joint Pub 4-02.2, 30 December 1996).

[17] Ibid.

operations by installing Aeromedical Evacuation Ship Sets (AESS). Aircraft are configured by airline contracted technicians. There are two standard configurations for each airframe series. The series 200 may be configured to support 111 litters and 2 seats, or 87 litters and 22 ambulatory seats. The series 300 may support 111 litters and 26 seats, or 87 litters and 56 ambulatory seats. The B-767, like the C-130, requires an oxygen subsystem when transporting patients needing supplemental oxygen. The cabin is, however, equipped with oxygen and electrical outlets at each litter site.[18]

E. PATIENT MOVEMENT ITEMS (PMI)

"A major factor in the evacuation of patients through the five echelons of medical care is that specific medical equipment and durable supplies designated as patient movement items (PMI) must be available to support patients during evacuation."[19]

When a patient requires evacuation, it is the originating treatment facility's responsibility to provide the necessary PMI to support the patient during evacuation. This PMI accompanies the patient throughout the chain of evacuation, from the originating treatment facility to the destination, whether the evacuation is an intra-theater or inter-theater transfer. The Services will include and maintain initial quantities of Joint Readiness Clinical Advisory Board (JRCAB) standardized PMI in the appropriate medical assemblages. Appendix A lists all PMI items. Figure 4 is the current PMI equipment requirement contained in

[18] (ANNEX Q to AMC OPLAN (Q) (QPR;SGX).

[19] (Joint Pub 4-02; 26 April 1995, p. II-3).

deployable modular kits, known as Patient Evacuation Kits (PECKS).[20] Appendix B lists the complete (PECK) assemblage.

Item	Qty
VENTILATOR	4.
PULSE OXIMETER	4.
OXYGEN ANALYZER	4.
DEFIBRILLATOR	4.
VITAL SIGN MONITOR	4.
SUCTION (Continuous/Intermittent)	8.
INFUSION PUMP	4.

Figure 4. (Peck) Equipment Items

F. PATIENT MOVEMENT ITEMS SYSTEM

The PMI system mission is to support in-transit medical capability without removing life-supporting equipment from patients, to exchange in-kind PMI without degrading medical capabilities, and to provide prompt recycling of retrograde PMI.

This system manages PMI equipment and material through a seamless in-transit patient and/or equipment management process, from initial entry to final destination. Figure 5 depicts the PMI equipment flow through treatment facilities and aeromedical evacuation of Echelon III through V.

[20] (Ibid.; Appendix A, p. A-1).

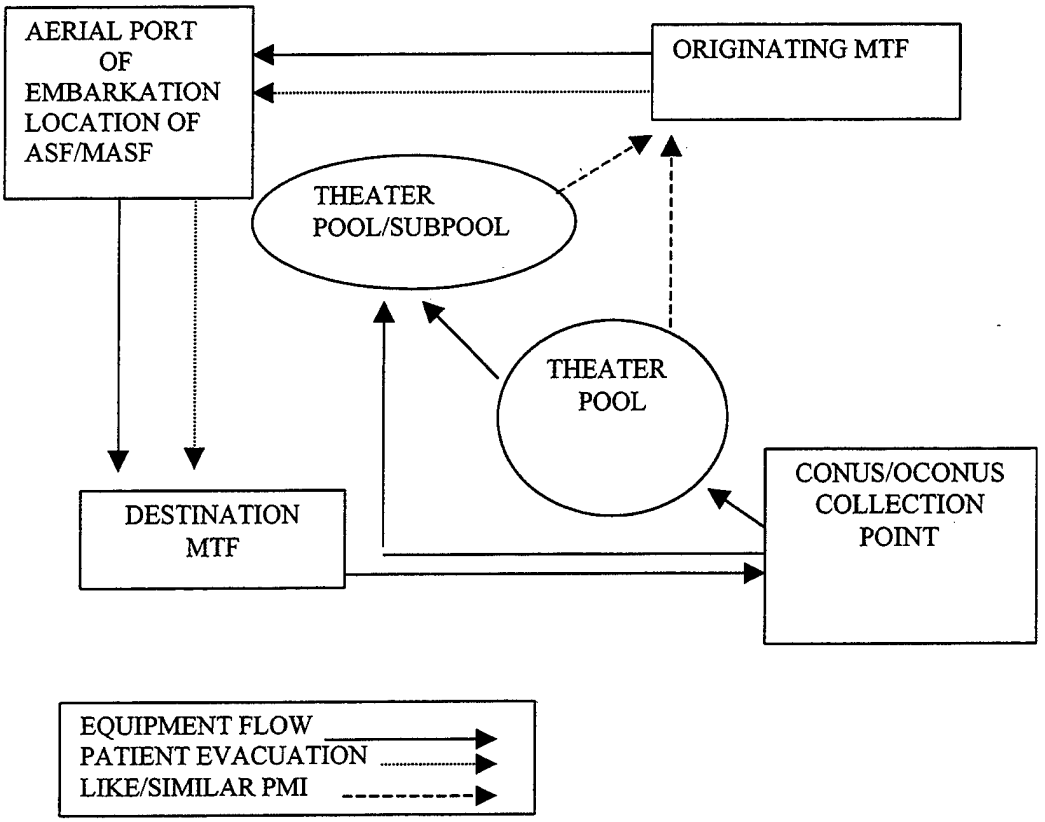

Figure 5. PMI Medical Equipment Flow[21]

G. PMI CENTERS

The PMI program consists of several PMI centers, each responsible for regional and global PMI assets management. CONUS centers include two large hubs; an east coast facility at Andrews AFB, MD and a west coast facility at Travis AFB, CA. There is a smaller hub located at Scott AFB, IL with a direct link to AMC/Surgeon General for overall direction. OCONUS PMI Centers are

[21] Ibid., p. II-4).

collocated with existing theater AE units at their hubs in Ramstein (Germany) Airbase and Yokota (Japan) Airbase.

Each PMI Center can deploy PMI Cell personnel and assets to forward locations, depending on theater facilities, airstrip locations, available manpower, degree of conflict and urgency of need in conjunction with theater plans. Appendix C defines PMI Centers, Cells and Training locations and the responsible Unit Command. As the theater matures, the Army Single Integrated Medical Logistics Management (SIMLIM) process is established. The PMI centers/cells coordinate as necessary with the SIMLIM to obtain support in requisitioning, storage, maintenance, and battlefield distribution of PMI related items.[22]

Once at the destination MTF, patients are separated from the PMI and use organic assets. PMI will then be cleaned and sent to the nearest PMI Center for processing. The Center will repair PMI as necessary, update asset visibility and process PMI for shipment to support theater requirements.[23]

Figure 6 illustrates the PMI process flow from the battlefield through the AE system and each medical care level to the CONUS MTF, and the return flow of PMI to the forward battlefield medical unit.

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[22] (Ibid., p. I-8).

[23] (www.armymedicine.army.mil/jml2010.html, project plan).

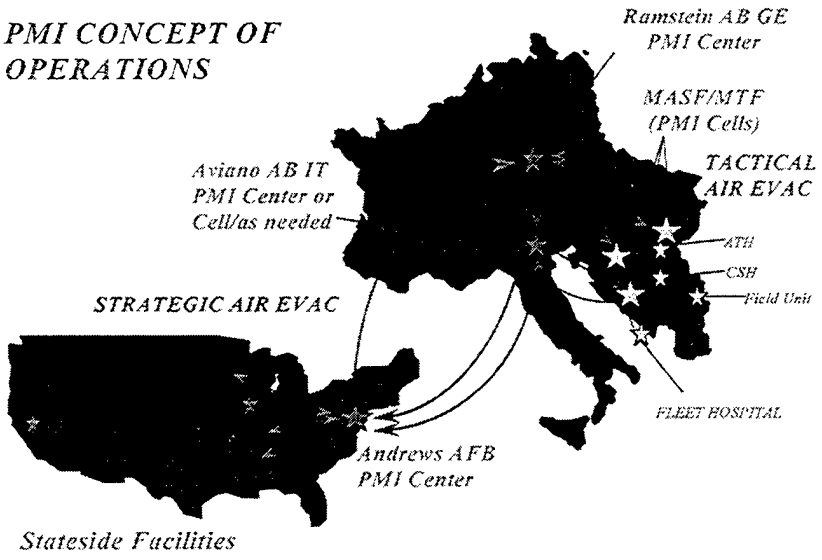

Figure 6. PMI Distribution Flow

H. SUMMARY

This chapter outlined the patient movement process through the five echelons of care. Each echelon was identified by the intensity of care provided. Types of organic dedicated and designated airlift were examined by providing the maximum evacuation capacity in various configurations. The CRAF air fleet assets were introduced as an optional strategic aeromedical evacuation resource with casualty capacity identified. Finally, the PMI process and its theater responsibility was defined. This thesis will now research possible cost savings or deferment modifications.

III. PMI PROGRAM

This chapter reviews the operation of the Air Force Medical Logistics Office (AFLMO) Patient Movement Items Program (PMI), located in Fort Detrick, Maryland. AFMLO is designated by AMC as the lead agency for management, procurement/acquisition, maintenance, and storage pre-positioning of all PMI assets world-wide. The chapter examines the areas of mission, objectives, program funding, procurement/acquisition plan, maintenance and serviceability, standardization, and inventory storage.

A. MISSION

While the PMI program is mandated by the Assistant Secretary of Defense (Health Affairs), the Air Force Surgeon General (USAF/SG) has oversight responsibility and the Air Mobility Command Surgeon General (AMC/SG) conducts program management. The development and implementation is shared by the AMC/SG with AFMLO, who coordinates the PMI procurement process. Periodic reviews of the PMI program are conducted to address such details as: item management, requirement quantities, changes in theater threat and contingency operations, supplemental items, process improvements and overall program status. [24]

The AMC/SG is responsible for computing quantities required for each item in the PMI program based on current planning guidance. The requirements

are based on patient stream projections, which are formulated on the scenario of two nearly simultaneous major theaters of war, and an aeromedical evacuation policy of seven days for the combat zone and a combined total of fifteen days for the combat zone and the communications zone. AFMLO provides the administrative expertise for tasks initiated by the AMC/SG and USAF/SG affecting the PMI program.

The AFMLO PMI Team's responsibility is to develop and implement policies, procedures, and systems for globally managing (PMI) used in evacuating and transporting military patients throughout tactical and strategic levels of the military healthcare system. The vision for patient movement items calls for:

- Near perfect availability and serviceability of all patient movement items in the military healthcare system, regardless of geographic location, dispersion, or intensity of use.
- A process for the systematic modernization and enhancement of PMI, including effective approaches to the inter-operability of PMI with evacuation platforms throughout the military healthcare system.
- A program for tracking PMI items which provides 100 percent visibility throughout the military healthcare system.
- A program for redistributing and reutilizing PMI items to insure maximum utilization of all PMI assets throughout military operations of indeterminate length.

The objectives of the PMI program are:

1. Prevent the one-way flow of PMI out of the theaters, depleting capabilities for both the military treatment facilities treating the

[24] (www.armymedicine.army.mil/jml2010/pmi./html; Concept of Operations).

casualties and the AE system transporting patients and providing in-flight medical care.

2. Maintain item serviceability through a structured preventive maintenance program and timely repair services.

The PMI "Concept of Operations," depends heavily on developing and maintaining a PMI pool of equipment sufficient to supply the transport requirements for all patients in the aeromedical evacuation pipeline. The complete AE pipeline includes equipment used during patient transport, equipment in transition from receiving medical treatment facilities returning to the nearest PMI center, equipment in the transportation system, equipment in maintenance and repair, and equipment to support the "in-kind" exchange with service organic assets. The result is a substantial equipment requirement. The Concept of Operation mandates procurement, pre-positioning, warehousing and complete peacetime and wartime integrated logistics support for all equipment.[25] The concept is predicated under the direction of Joint Vision 2010's "Focused Logistics" concept, where services are responsible for determining the requirements for secondary item war reserves and programming resources, through the budget process, for procuring PMI inventory.

Currently, investment in war reserve material (WRM), as which PMI is classified, is among the lowest priority in the POM process, being subordinated to programs having greater readiness impact or sponsorship. The war reserve

[25] (www.armymedicine.army.mil/jml2010/pmi.htm; "Concept of Operations," 1998).

inventories and defense planning requires Services to: 1) acquire and position critical assets to maximize war fighting capability; 2) repair only those assets for which there is a valid requirement; 3) procure new or additional items to fill demonstrated shortfalls or significantly improve joint force capability or survivability. Acquisition of these stocks is not currently being achieved within existing Service programming limitations and priorities. The dilemma for the Service components and operational commanders is whether plans for relying on WRM must be constrained by available investment dollars.

B. PMI PROGRAM FUNDING

Funding for the PMI project was programmed in the FY 98-03 POM and was the number one initiative for the Air Force Medical Services. The total funding stream is approximately $59 million dollars to reach 100 percent readiness capability by FY 03. This program is dual funded by two separate appropriations: the Office of the Secretary of Defense, Health Affairs (OSDHA) Defense Health Programs (DHP); and the U.S. Air Force, War Reserve Material, appropriation. In FY 98, DHP appropriated $6.9 million dollars of Operations and Maintenance funds and the Air Force WRM Other Procurement allocated $1.3 million dollars to PMI. The total funding allocation from both of these appropriations only accounted for a 13 to 20 percent readiness capability. In FY 99, DHP allocated $6.74 million dollars, while the Air Force did not provide any funding for the

program. The DHP funding for FY 99 only increased readiness procurement capability by seven percent to twenty seven percent total mission readiness.[26]

Although PMI was a priority for the Air Force Medical Services during POM FY 98-03, the outyears show signs the PMI project may be in jeopardy of not accomplishing its readiness goal of 100 percent by FY 03. Specifically, FY 99 did not receive an allocation, creating a $700,000 dollar shortfall. The shortfall directly impacts the ability to attain the dual certification testing of PMI for use on rotary wing and fixed wing aircraft; program management; and program support training. Given the fact that the funding outlook for FY 99 and beyond is less than ideal, it has become imperative that AFMLO develop a contingency plan to ensure continued progress towards meeting the mission capability requirement by FY 03. Appendix D provides a detailed analysis of POM submissions, actual funding and the variance between.

Due to the lack of outyear funding, innovative business practices are being reviewed to offer possible cost savings or deferment. Some of these include: acquisitions/contracting practices; standardization plans; and strategic pre-positioning of PMI equipment at specific PMI centers.[27] Appendix E details the funding requirements for the PMI program, current readiness level, and displays

[26] Ibid.

[27] Ibid.

cost savings by acquiring material requirements from excess equipment at other facilities.

C. ACQUISITION/CONTRACTING PMI

The current equipment procurement plan is based on increments of capability across all PMI equipment, spare parts, test equipment, and supply items. Appendix F displays the increments across the Fiscal Years. Equipment is being purchased using multi-year contracts based on essential characteristics developed by all Services and the JRCAB. These contracts are open for purchasing all Service organic assets. Procurement actions have many possible avenues and selection is based on meeting the PMI needs at the lowest delivered cost. Two alternative arrangements include:

- Vendor managed inventory, where vendors receive contracts to maintain adequate inventories of long lead-time parts. When notified, required quantities are assembled, based on pre-determined delivery schedules that reflect expected patient evacuation projections.

- Multi-vendor contracts are solicited to manufacturers and vendors producing or distributing similar equipment items that meet the same basic minimum specification. This concept offers advantages and disadvantages. The multiple vendor option enables AMC to receive greater quantities of critical equipment in a shorter period of time. However, disadvantages involve incompatibilities between similar consumable products made by different manufacturer's. Incompatibilities are the greatest motivator for completely standardizing PMI.

AFMLO submits most equipment procurement requests through the Defense Supply Center, Philadelphia, PA (DSCP). DCSP, a joint logistics agency,

within the Defense Logistics Agency, provides the Service's medical acquisition/ procurement administrative support. DSCP's Medical Directorate routinely negotiates "best buy" contracts for AFMLO, to maintain readiness of the PMI project. The contract methods negotiated by DSCP differ from those that AFMLO uses and are better suited for operational entities.

DSCP continues to build its future on the same founding concepts for the PMI program: Joint Vision 2010, Focused Logistics, and specifically JML 2010. DSCP continues to re-engineer their current processes by developing new and innovative partnerships with the commercial healthcare industry to improve medical readiness support and reduce Service readiness costs. DSCP has currently established a number of viable contract options that may provide the PMI program financial relief, while maintaining readiness. All of these contract concepts rely on industrial preparedness planning with commercial entities. Current DSCP contract options available for the operational or combat units in a peacetime environment include:

1. **Prime Vendor** - provides participating facilities with a "prime" supplier for a commodity line and is a key component of peacetime medical logistics support. Prime Vendor sales provide leverage to support critical readiness requirements by using a surge clause within the contract. The prime vendor option has been utilized to support lower intensity contingency operations, operations other than war and military exercises.

2. **Stock Rotation** - provides an effective tool in the readiness arsenal to cover shortages of critical line items. In this program, DSCP Medical purchases material from a manufacturer, which is then stored at the manufacturer's facility and rotated with their

commercial customer base. These contracts are normally long-term agreements with the manufacturers, covering at least 10 years. The supplies/equipment is purchased by DLA with Warstopper funds, and Medical Stock Fund dollars pay the rotational fees charged by the manufacturer.

3. **Corporate Exigency Contracts (CEC)** - establish long term partnerships with manufacturers to provide sustainment material which meets the Service's material requirements in time of conflict or military need. CEC's buy access to material by partnering with industry, vice purchasing material for depot warehousing and pre-positioning PMI in the PMI Centers. The Corporate Exigency Contract requires awarding multiple contracts for the same product line or group. This ensures the industrial base is prepared to respond to Service demands and support contingency operations prior to production ramp-ups. In addition, these contracts help the industrial base respond more effectively and rapidly to service requirements since the procurement mechanism is already in place and tested. The Corporate Exigency Contract is an insurance policy to contractually ensure material access and to maintain a high degree of medical readiness for a contingency. There are no anticipated peacetime sales under this program, so it is well suited to outfit the PMI program.[28]

4. **Commercial Asset Visibility (CAV)** - CAV is inventory levels and sales volume data for the commercial and public sectors. There are two pieces to CAV, contractual and non-contractual. Contractual encompasses visibility over items with a contract in place to cover requirements, including: VMI, CEC, Stock Rotation and Prime Vendor (Surge) options. Contractual data is easily obtainable for analysis. Non-contractual CAV is the sales and inventory information from the manufacturers and distributors necessary to analyze the commercial supportability of readiness items. The non-contractual CAV provides visibility of data critical to surge and sustainment planning. This data helps DoD determine whether the Services are going to war with the right material. The data also measures commercial throughput in terms of sales quantity, which equates to a current production level capability. Production capability better

[28] (www.dscp.dla.mil/medical/custserv.htm; 1999).

indicates supportability than a snapshot of inventory levels, because it demonstrates the healthcare industry's ability to support DoD.[29]

5. **Readiness Management Application (RMA)** - This concept is a management tool, enabling DSCP and the Services to visually incorporate PMI data into one relational database. The RMA information system will support military missions throughout the operational spectrum into the next century. This system is currently under development, with funding provided by the Defense Medical Logistics Standard Support (DMLSS) Program Management Office. RMA will enable commanders and logisticians to assess Class VIII medical material by linking all users through a wholesale readiness related link. With this data, users will be able to collaborate and solve medical readiness challenges. The RMA database will also feed into the Joint Total Asset Visibility repository via the medical Logistics Total Asset Visibility system. All DoD users can access this database.[30]

The DSCP Medical Directorate continues to institute new and innovative contract methods to support our operational forces. The PMI management office at AFMLO did not utilize any of the DSCP methods during FY 98. The concepts and processes surrounding these DSCP methods are relatively new; many are only now being tested. They may offer viable options for the out years.

The FY 98 to FY 03 procurement plan is provided in Appendix B. The plan displays equipment purchased by PMI Center, including current readiness capability, forecasted buys, and anticipated readiness levels. Appendix C shows the current capability at each PMI Center without forecasted procurement

[29] Ibid.

[30] Ibid.

quantities. Figure 7 shows the anticipated readiness capability from September FY 98 to FY 00 by incremental readiness capability.

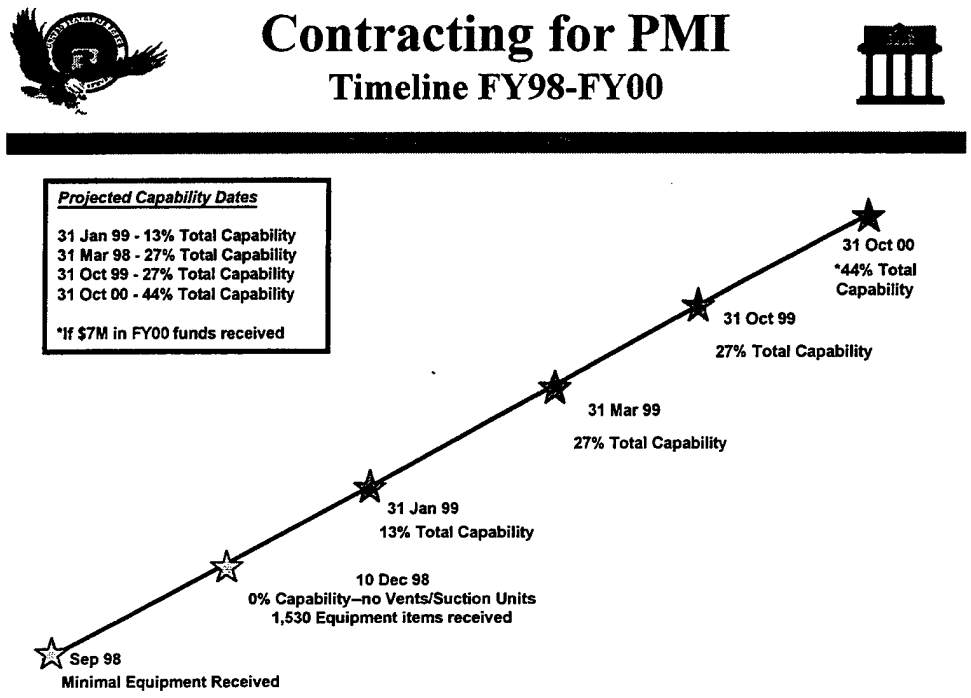

Figure 7. PMI Contracting Timeline[31]

D. STANDARDIZATION/TECHNOLOGY

PMI equipment will be standardized to the maximum extent possible. There are variances to this claim; satisfying the total service requirement, the PMI Program Office will solicit multiple vendors for products meeting the basic equipment specification, rather than only limiting procurement to a single brand, model or type. This poses compatibility problems for durable and consumable attachment items used in operating the equipment.

[31] www.armymedicine.army.mil/jml2010/pmicontract; 1999.

Technology assessment is another critically important activity for any organization interested in providing high-quality, cost effective healthcare. Advances in technologic capabilities of equipment have grown exponentially in past decades. Given the complexity of today's healthcare environment, Medical Planners who do not use thoughtful, well delineated and objective decision making processes for technology review may realize that inappropriate capital expenditures have been made.

The process of technology assessment is a responsibility of the JRCAB and if done correctly may be one of the single most important strategic planning tools available toward total readiness planning. The process for technology assessment is in place, but heavily influenced by physician preference. Equipment upgrades, changes or obsolescence is frequently based on a change in operational staffing and physician preference. This practice creates extensive capital expenditure and material loss. Additionally, the learning curve for support staff creates another functional as well as financial inefficiency.

E. MAINTAINABILITY/SERVICEABILITY

Biomedical maintenance support is necessary to maintain the serviceability and integrity of PMI equipment. Currently, the only biomedical maintenance support is at the PMI Center, and the associated manpower is a single technician. Returning PMI back into the theater of operation is constrained by limited bio-technical support, causing AMC to increase inventory to cover maintenance repair

delays. Another factor for maintenance is the test equipment required to perform basic calibration and preventive maintenance. This has been a significant funding curve for the PMI project and will continue to plague the program if adequate manpower is not provided at the PMI Centers. The funding required for maintainability/sustainability provides additional support for deferring procurement expenses and only maintaining the essential PMI outfitting for those first deployed units.

F. INFORMATION & TRACKING SYSTEM

The equipment tracking system for PMI must meet many key requirements such as:

- Provide equipment location data, while in transit, redistributed to other AE units, in warehouse inventory or out of service for maintenance.
- Provide maintenance reporting data to indicate deficiency, time to repair, and parts required for repair.
- Enhancement and software capability for upgrading technology and interfacing with future defense medical logistics systems, such as, DMLSS to initiate PMI material transfers from one point to another upon request.

The system chosen to support the PMI AE process is a commercial off the shelf (COTS) system known as PLEXUS. This system uses bar code technology that enables the system to provide the necessary information using hand held bar code reading devices used by AE personnel throughout the PMI logistics

process.[32] The PLEXUS system was tested during the Air Force AE "Patriot Medstar" in June of 1997. The reviews following "Patriot Medstar" showed the system to possess all the functionality requirements; each conferred the highest recommendation for acceptance as the PMI AE system. PLEXUS has been implemented and installed at the 5 PMI Centers and is utilized currently for peacetime AE operations.

The AMC TRANSCOM Patient Movement Directorate has developed TRACES 2, a patient regulating system, which includes medical logistics materials tracking. The two systems are not compatible and operate independently of one another. TRACES 2 isn't identified as the PMI tracking system, but may afford the same level of quality and logistics total asset visibility as PLEXUS. As the medical regulating information system, TRACES 2 tracks patient movement and equipment attached to those patients all the way through the AE and Echelon V care spectrum. AMC may want to investigate TRACES 2 as a PMI logistics system, saving any additional expenditure into PLEXUS.

G. AIR WORTHINESS CERTIFICATION

All PMI must first be tested for air worthiness by the Army. Dual certification for rotary and fixed wing aircraft must be completed before any PMI item is authorized for use onboard an aircraft (C-9A). This is a detailed and labor intensive process, which results in delays for approved items. The Army is

[32] Ibid.

responsible for certifying PMI plus all weapons systems, communications devices or any other equipment that may be affixed to a military airframe. The long certification process compromises readiness capability.

H. SUMMARY

This chapter outlined the PMI concept of operations, including this program's joint guidance and direction from the highest level of DoD. The most integral part of this project is the contractual arrangements utilized to support the readiness mission for peacetime and contingency operations. The funding to support the PMI program was reviewed to include the source providers. Anticipated funding shortfalls were addressed for the immediate outyear. Figure 8 provides a pictorial view of the PMI system as it relates to JML 2010.

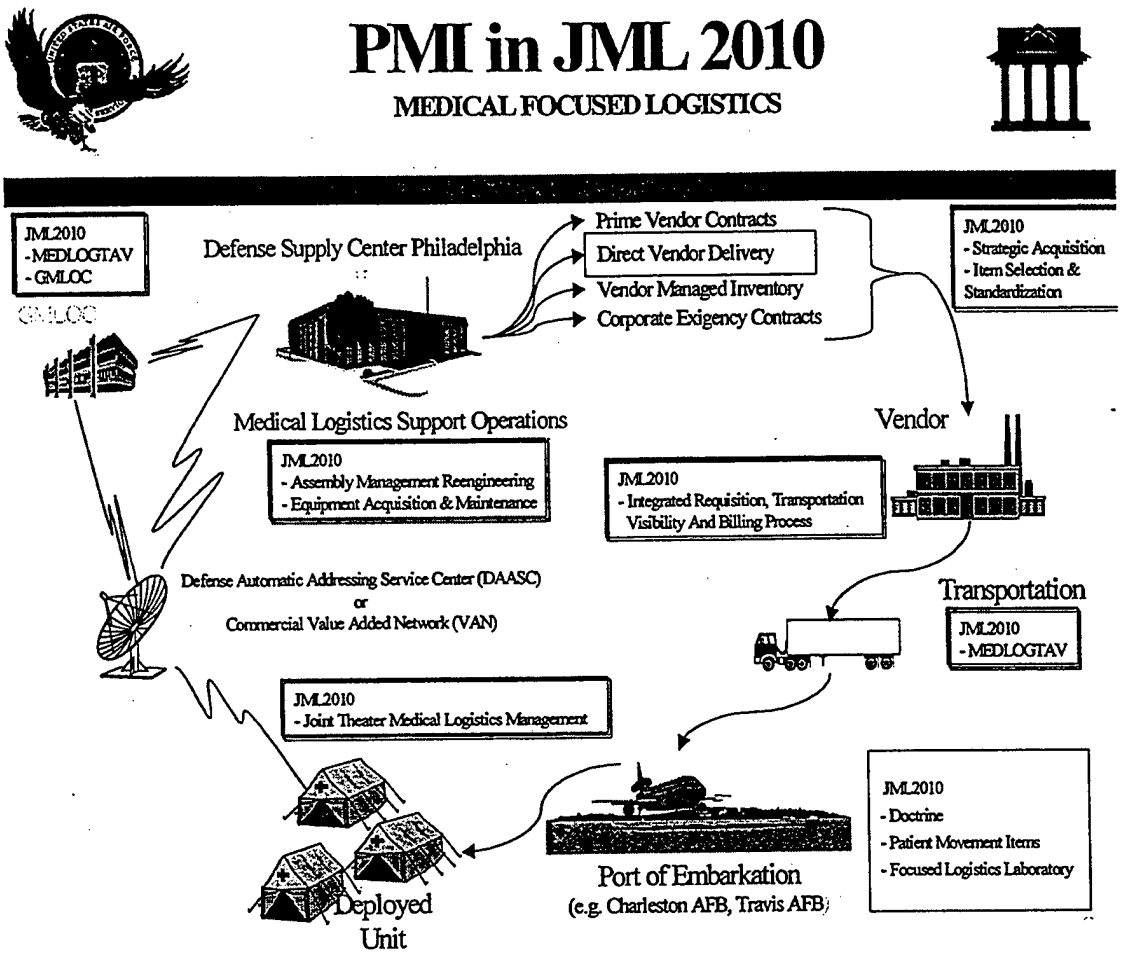

Figure 8. PMI in JML 2010

This thesis will now analyze the Joint Doctrine, Policy, Concept of Operation, contracting practices and warehousing methods of the PMI process. From the analysis; suggestions for potential cost savings or product deferment are recommended.

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IV. PMI EQUIPMENT ANALYSIS

This chapter analyzes PMI inventory requirements necessary to sustain a sixty-day demand cycle as chartered by AFMLO, Fort Detrick, Maryland. A simple linear program was used to determine the optimal peacetime PMI inventory. The optimal inventory is based on manufacturer's production capacity and order lead times. The resulting information is displayed and alternative procurement planning is recommended to illustrate procurement cost deferral.

A. REQUIREMENTS DETERMINATION

The most difficult measure for a logistician is planning for contingencies. There are many variables affecting inventory, most importantly the ability or inability to receive replenishment stock during such events. The philosophy for many years has been to procure enough material to sustain the forces for extended periods in the forward battlefield. This philosophy was promulgated by the manufacturer's inability to meet the DoD demand requirement in an acceptable period of time. AMC and AFMLO still subscribe to this standard, setting the peacetime PMI stock point at not less than 60 days of projected demand.

The sustainability plan is built from casualty Treatment Briefs that outline casualty condition, diagnosis, treatment and evacuation protocols. The Treatment Briefs are a cooperative compilation of quad-service committee representatives at the Joint Readiness and Clinical Advisory Board (JRCAB), Fort Detrick, Maryland. Members of this committee include Physicians, Nurses, Physician

Assistants and Enlisted Medical Personnel. The members ensure each service is represented and the service specific casualty estimates recorded. To date, JRCAB has produced more than four hundred Treatment Briefs that must be supported by the PMI and WRM supply chain.

B. ANALYSIS CALCULATIONS

The analysis was calculated by developing a linear program model using Microsoft Excel with the solver module. Each linear program equation identified product specific constraints, such as lead-time and production capacity; the initial starting inventory was minimized. Demand was calculated as approximate daily demand based on the ten day incremental estimate provided by AFMLO. We also include a safety stock value that includes inventory covering the first demand. This could in part allow for up to 5 days for initial inventory processing and bio-medical maintenance and calibration. The formulation is:

Choose x_t *to Minimize* I_0

Subject to :

$$I_t = I_{t-1} - d_t \qquad t = 1,..., (\ell - 1)$$

$$I_t = I_{t-1} + x_{t-l} - d_t \qquad t = \ell,..., T$$

$$\sum_{t=i}^{i+l-1} x_t \leq C \qquad i = 1,..., (T - \ell + 1)$$

$$x_t, I_t \geq 0 \qquad \forall t$$

where :

$x_t \equiv$ *order quantity in period* t

$I_0 \equiv$ *beginning inventory*

$I_t \equiv$ *inventory in period* t

$\ell \equiv$ *lead time*

$d_t \equiv$ *demand in period* t

$C \equiv$ *producer 's capacity every* ℓ *time periods*

The constraints for each product are based on approximated data provided by AFMLO. The lead times, manufacturer capacity, and unit cost for each items are summarized in Table 1.

Table 1. PMI Equipment Constraints

Item	Lead Time	Capacity	Unit Cost
Vital Sign Monitor	7 days	250	$6,768
Defibrillator	5 Days	250	$7,147
I.V. Pump	10 Days	100	$1,300
CISU Suction	8 Days	200	$676
Ventilator	14 Days	50	$8,000
Oxygen Analyzer	3 Days	400	$587
Pulse Oximeter	3 Days	150	$1365

Each of the seven items was analyzed using the same model structure. This linear programming model identifies a cost deferment of $24,468,308 dollars over currently planned inventory levels.

The linear program model developed for this research provides results in non-integer values. The results reported here are rounded to the nearest integer. Rounding errors are insignificant and have little impact on the results provided by this research.

Recommended ordering plans are calculated starting on day 1 of the contingency or war. In fact, actual ordering may begin when war is imminent. The purpose of this research was to determine whether cost deferment is possible within the PMI program by deferring material purchases. The most conservative case is to assume procurement is delayed until the contingency begins. The linear program model is a valid means of determining initial inventory and calculating total deferrable costs. If procurement began several days in advance of the contingency, the initial inventory could be reduced further.

The following are the results for each PMI equipment item:

1. **Vital Signs Monitor** - The constraints applied to this product include an order lead time of seven days and the manufacturer's maximum production capacity of 250 units every seven days. The five day safety stock level is 255 monitors. The required initial optimal inventory is 1669 monitors on-hand during peacetime operations. The cost is $6,768, so the optimal inventory

investment cost is $11,295,792 dollars. The beginning inventory is sufficient to satisfy twenty-eight days of demand; the first order is placed for 250 monitors on day two of the conflict. The current on-hand inventory is 994 monitors and 675 additional monitors are necessary to meet the optimally projected inventory assuming a seven-day lead-time. The cost to procure the remaining monitors is $4,568,400 dollars. The optimal inventory recommendation is less than AFLMO's current stockage strategy of 3414 units by 1745 monitors, representing a direct cost deferment of $11,810,160 dollars. Figure 9 illustrates daily inventory levels by day. Appendix J displays the linear program results. The peaks in the pattern indicate when orders are received.

Another means to reduce initial inventory cost is to negotiate a shorter order lead-time with the manufacturer. For example, shortening the order lead-time from seven to three days defers more than $8 million dollars in initial inventory. Figures 10 illustrates the average inventory differences over a sixty-day period; Appendix K provides the detailed linear programming results.

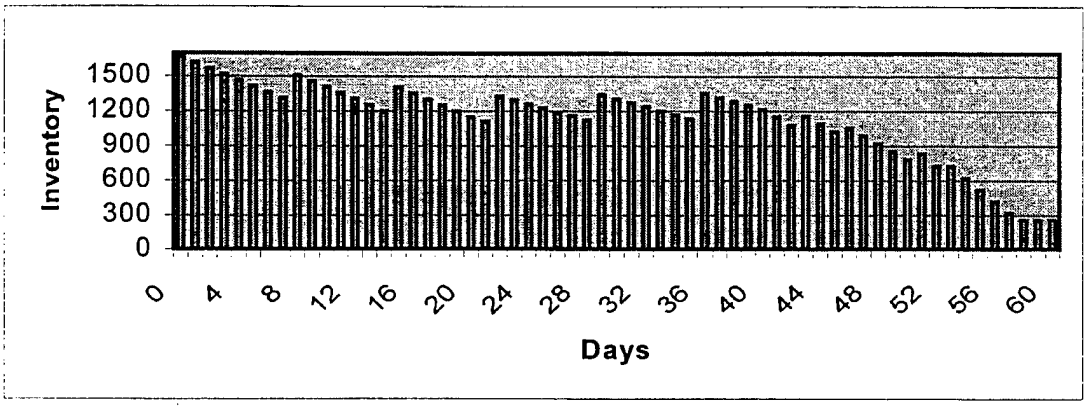

Figure 9. Vital Signs Monitor 7 Day Order Lead Time

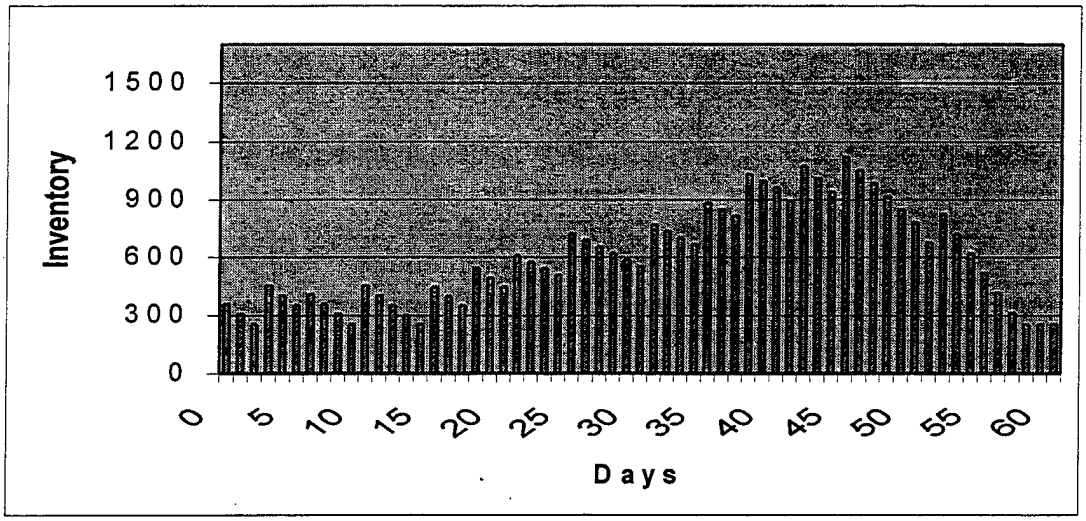

Figure 10. Vital Signs Monitor 3 Day Order Lead Time

2. **Defibrillator (Life Pack-10)** - The manufacturer order lead-time is five days with a maximum production capacity of 250 units every five days. The five-day safety stock constraint quantity applied is 100 defibrillators. The resulting optimal inventory is 177 defibrillators; the unit cost is $7,147, so the optimal inventory investment cost is $1,263,589 dollars. Current on-hand inventory is 362 defibrillators with a target of 1280 units. This inventory target exceeds the optimal quantity by 1103 units; the on-hand stock exceeds the optimal inventory by 185 defibrillators. The current inventory goal represents a total cost of $9,148,160 dollars, exceeding the optimal inventory cost by $7,884,571 dollars. The recommendation is to suspend buying this product and allocate the remaining funds toward purchasing deficient PMI equipment balances based on the optimal stock levels. Figure 11 illustrates daily inventory levels over the sixty-

day period based on the linear program. Appendix L provides a detailed illustration of the linear programming result.

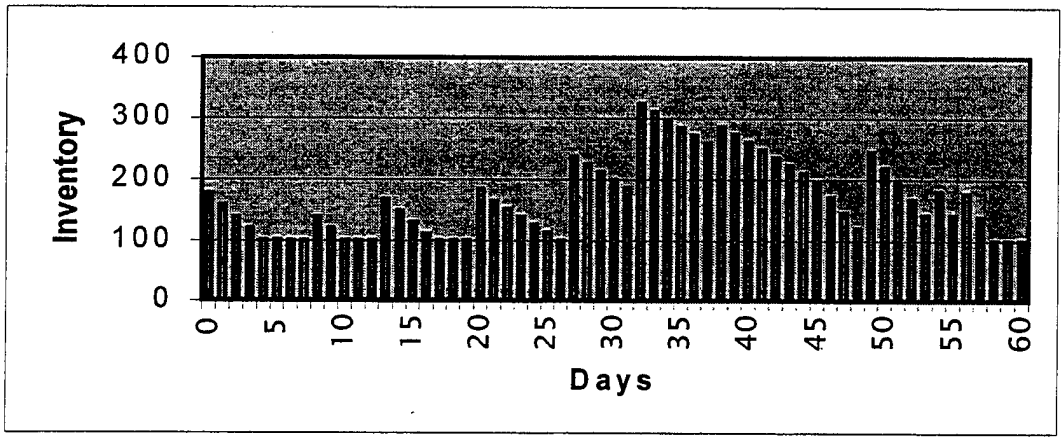

Figure 11. Defibrillator Life Pack-10, 5 Day Lead Time

3. **Infusion Pump (MSIII)** - The order lead-time for infusion pumps is ten days and the manufacturer's maximum capacity is 100 pumps every ten days. The five-day safety stock level is 83 pumps. The current inventory is 311 pumps and the strategy is to procure the sixty day requirement totaling 1100 pumps at a per unit cost of $1300. The funding necessary to meet the sixty days stock level is $1,430,000. Applying the linear program model with the aforementioned constraints indicates minimum required inventory level of only 650 infusion pumps during the peacetime period. Since the manufacturer can re-supply infusion pumps, it is no longer necessary to procure the 1100 pump target. The inventory deferment represents a savings of $585,000. Figure 12 illustrates the daily inventory schedule based on this plan. Appendix M provides a detailed illustration of the linear programming results including re-order points.

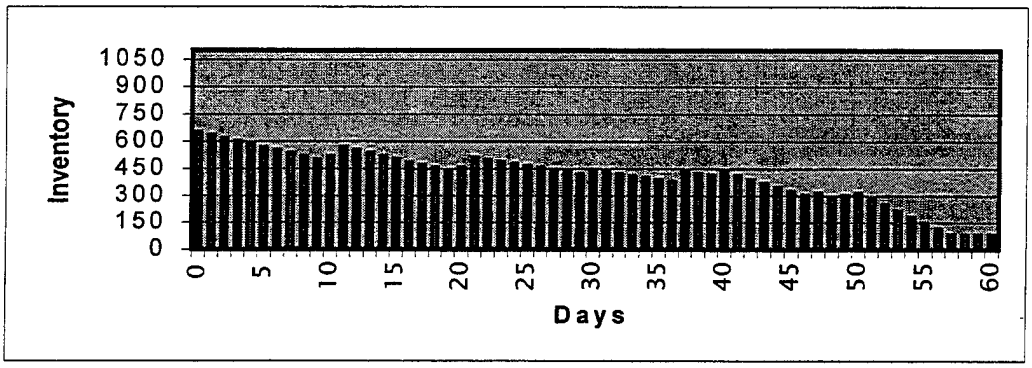

Figure 12. MSIII Infusion Pump 10 Day Lead Time

Additional savings may be realized by negotiating a shorter lead-time with the manufacturer. For example, reducing lead-time from 10 days to seven days would generate an additional deferred savings of $347,100 in the optimal stock level, this represents a $932,100 savings over the current inventory strategy. Figure 13 provides a graphic depiction of the 7 day lead-time; Appendix N displays linear programming results for the shorter lead-time.

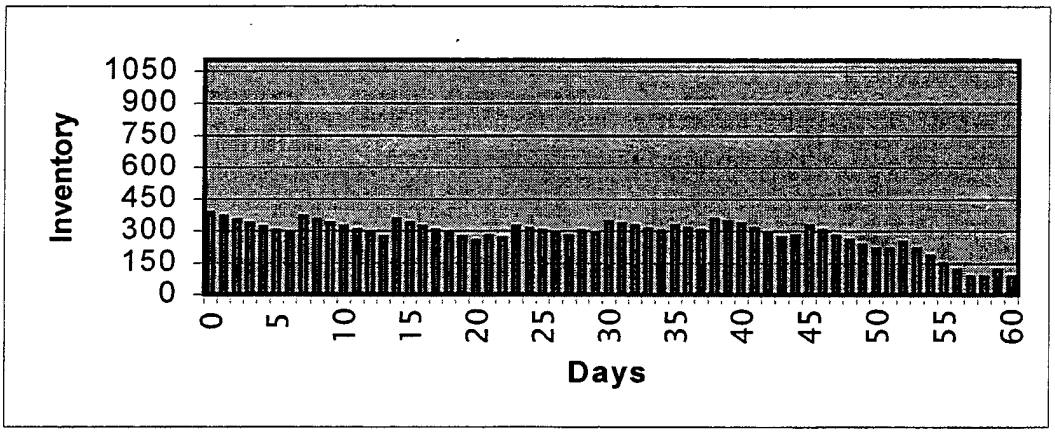

Figure 13. MSIII Infusion Pump 7 Day Lead Time

4. **Central Intermittent Portable Suction Unit (CISU)** - The lead-time for this PMI equipment product is eight days and the manufacturer's maximum capacity is 200 units every eight days. The safety stock level is 153 units. The sixty day required quantity is 2050 at a per unit cost of $676, for a total cost of $1,385,800 dollars. The current inventory balance is 575 suction units. Applying the linear program with lead-time and capacity constraints result in an optimal initial inventory level of 484 CISU's, at a cost of $327,184 dollars. This plan results in an estimated deferral of $1,058,616 dollars. Figure 14 illustrates the daily inventory levels recommended for the eight day lead time. Appendix O provides a complete overview of the linear programming results and purchase and stocking plan.

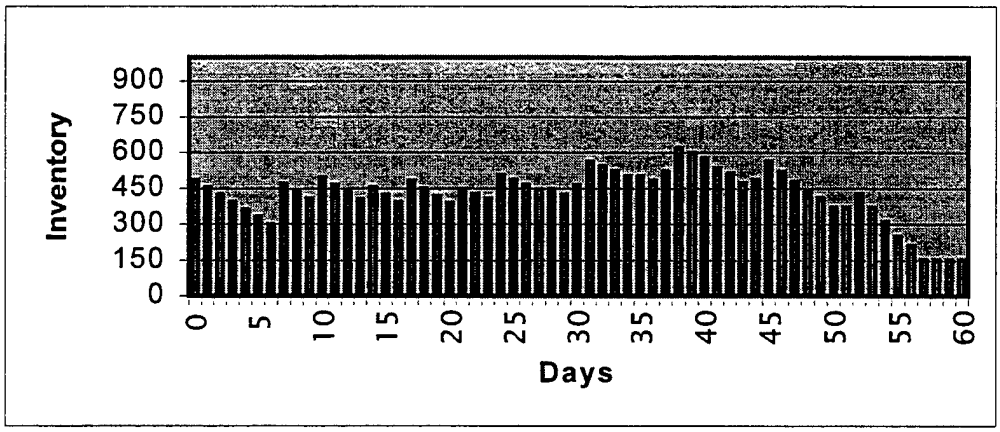

Figure 14. CISU 8 Day Lead Time

Figure 15 illustrates how additional savings of $1,199,224 dollars may be achieved by shortening the lead-time to 6 days. Appendix P is provided to detail the re-order plan.

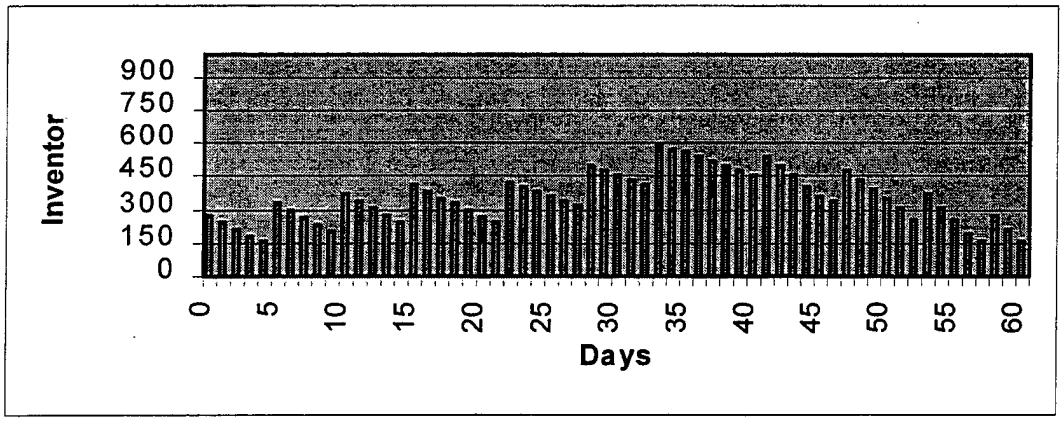

Figure 15. CISU 6 Day Lead Time

5. **Ventilator (754M)** - This PMI product exhibits significant savings if the linear programming stock level is accepted. The lead-time is fourteen days with a manufacturer's capacity of fifty units every 14 days. The five day safety stock level is 80 ventilators. The AFMLO sixty day requirement is 1078 ventilators and current on hand inventory is 319 units. At $8,000 per unit, these represent inventory investments of $8,624,000 and $2,552,000 respectively. The linear programming minimum quantity required incorporating the constraints is 958 units. Adopting the optimal inventory level creates an immediate deferred cost of $960,000 dollars over the total required inventory. Figure 16 illustrates the

daily inventory levels using the optimal purchase plan. Appendix Q is the comprehensive linear programming result and ordering plan.

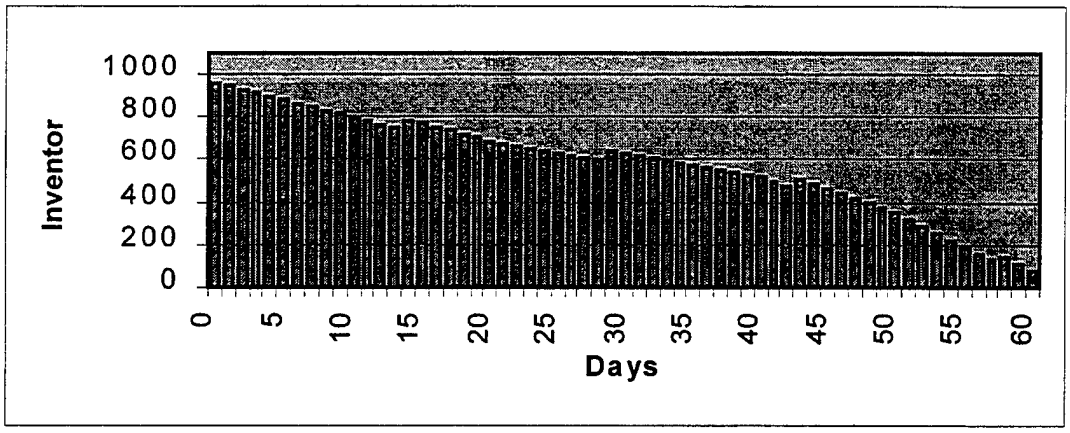

Figure 16. Ventilator 754M 14 Day Lead Time

An additional $400,000 savings will be achieved if the lead-time were reduced to ten days. Figure 17 and Appendix R illustrate the potential saving benefits.

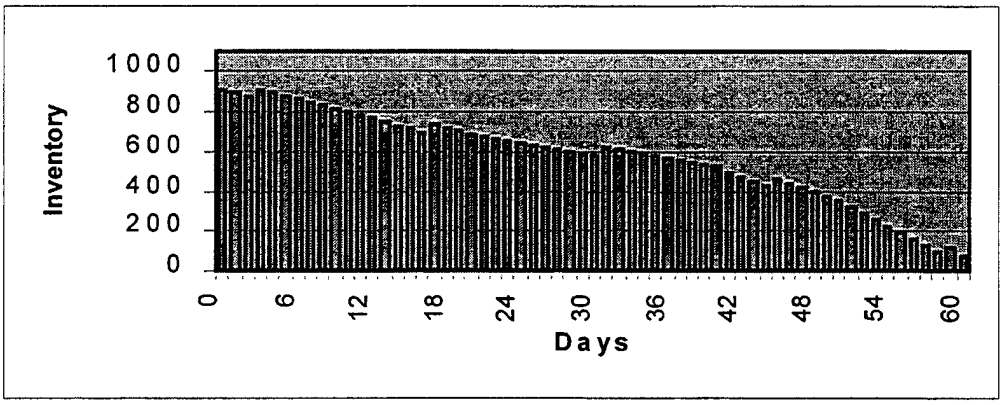

Figure 17. Ventilator 754M 10 Day Lead Time

6. **Oxygen Analyzer (MiniOx 3000)** - The lead-time for this product is only 3 days. The manufacturer's capacity of 400 units is not a constraining factor in acquiring the product when needed. The five-day safety stock is 100 units. The sixty day inventory level of 1359 oxygen analyzers is not required in advance. However, the procurement of the entire sixty day requirement may be a viable option in this case because the unit cost is only $587.00. The optimal initial inventory is 140 units, which represents a $707,335 savings over the sixty day inventory. Currently, 385 units are on-hand in PMI Centers; this represents a $143,815 dollar excess investment in initial inventory. Figure 18 graphically represents the recommended daily inventory levels. Appendix R provides the detailed linear programming results.

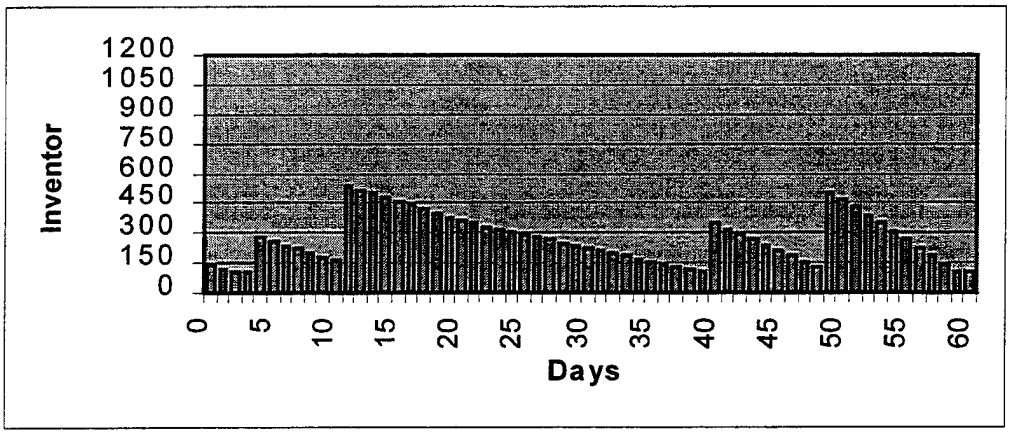

Figure 18. Oxygen Analyzer 3 Day Lead Time

7. **Pulse Oximeter (BCI 3303)** - Lead-time is three days with a manufacturer's capacity of 150 pulse oximeters in this cycle. The optimal initial inventory is 234 units costing $319,956 dollars. The unit cost for this item is

$1365. Figure 19 depicts the optimal daily inventory level and Appendix U is a detailed report outlining inventory, demand and ordering forecasts.

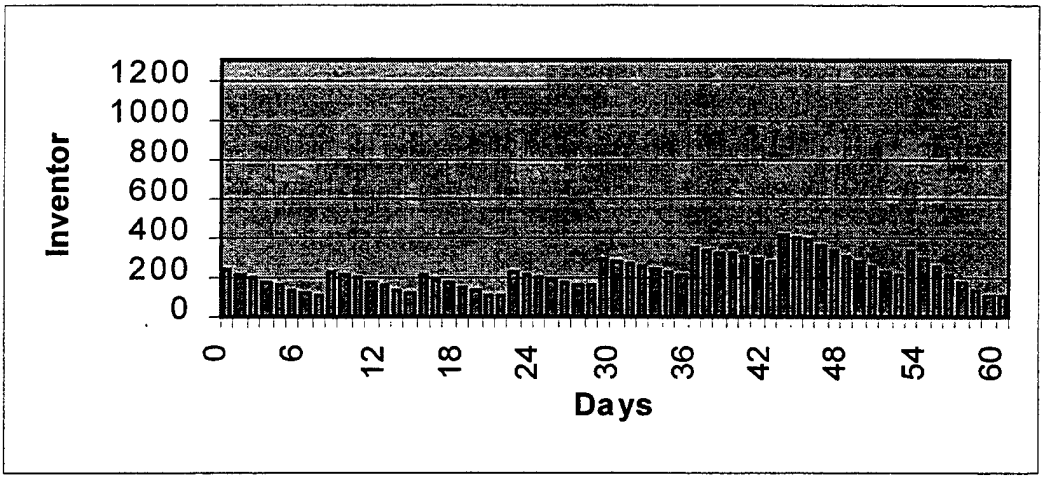

Figure 19. Pulse Oximeter 3 Day Lead Time

The initial inventory balances recommended by the linear programming model are subject to an element of risk. Risk weighting for the purposes of this analysis are incorporated in the safety stock value. PMI Managers and Military Leaders must evaluate the recommended inventory balances and adjust if needed to account for unknown risk values. The anticipated casualty counts are classified and unavailable for this analysis. The difference between the current on-hand inventory and the stock level recommended by the linear program requires an inventory investment of $10,121,100 dollars for 100 percent readiness, however, the optimal linear programming plan represents a $24,468,308 deferred inventory investment over stocking the entire sixty –day demand requirement. Figure 20

illustrates the costs for each of the strategies and the recommendation based on this research.

PMI Item	Unit Cost	On-Hand	Current Plan	Cost	Recommended Inventory	Cost	Cost to Recommended Readiness
Vital sign Monitor	$6,768	994	3414	$23,105,952	1669	$11,295,792	$4,568,400
Defibrillator	$7,147	362	1280	$9,148,160	177	$1,263,590	$0
I.V. Pump	$1,300	311	1100	$1,430,000	650	$845,000	$440,700
CISU Suction	$676	575	2050	$1,385,800	484	$327,319	$0
Ventilator	$8,000	319	1078	$8,628,000	958	$7,664,000	$5,112,000
Oxygen Analyzer	$587	385	1359	$797,733	140	$82,180	$0
Pulse Oximeter	$1,365	362	1300	$1,774,500	234	$319,956	$0
Total				$46,266,145		$21,888,822	$10,121,100

Figure 20. PMI Inventory Strategy Costs

C. OTHER COST SAVING INITIATIVES

1. **Cycle Time Reduction** - The PMI distribution cycle-time is the cumulative time it takes to cycle one piece of PMI material from the PMI center through the entire PMI chain and back to inventory. The process currently takes 1 day transit in theater, 1 day to a CONUS MTF, 10 days maintenance and service, and 10 to 14 days to return the item to available inventory. To reduce inventory requirements and conserve or save costs, AMC would compress or reduce cycle-time, increase efficiency and lowering inventory requirements.

To reduce cycle time, a critical path analysis is first conducted, analyzing the time and activities involved in each process step. The analysis determines bottlenecks that impede efficient throughput. The PLEXUS System will aid in

identifying processing time throughout each phase of the PMI cycle. Then proper steps to minimize bottlenecks may then be identified and implemented.

A relationship known a Little's Law [33] stipulates that reductions in cycle time result in equivalent reductions in pipeline inventories. For example, if AMC reduces the maintenance cycle time by 10 percent this action will reduce pipeline inventory by 10 percent. The formula for calculating pipeline inventory is expressed as.[34]

$$\mathbf{INV = \lambda CT}$$

where;

INV = Average Inventory

λ = Average Throughput

CT = Average Cycle-Time

2. **Distribution Resources Planning** - involves aligning with specific vendors/manufacturers in long-term relationships. The distribution center provides a direct inventory link to the vendor so that each manufacturer may capture demand data and visualize on-hand inventory in an effort to base production on the customer demand. By allowing manufacturers to accurately anticipate our demand requirement, they can stock parts, materials, and finished goods in time to meet our required delivery date. This process also permits the

[33] (Heizner).

[34] (Ibid).

manufacturer to minimize start-up cost, raw material costs and labor costs, which could generate savings for DoD. DSCP is developing cooperative contracting arrangements that follow this principle. The CEC and CAV initiatives are good examples of DOD's progress towards the DRP concept. There is still a gap between the user and the manufacturer of linking inventory visibility, government contracting regulations and single year appropriations for O&M spending.

D. SUMMARY

This chapter determined the optimal beginning inventory based on manufacturer production capacity, order lead time and safety stock, to account for potential risks. The results of this chapter suggest procuring PMI stock up to the linear programming model's recommended inventory level. The PMI Team Leader at AFMLO is taking these results under consideration and reporting the findings to the PMI Committee. When asked whether deferrals such as those recommended by this researches model, had been considered, the PMI Team Leader stated, "We had not considered using such a model and these results are worth our attention." The cost of the difference from the current on hand inventory for each of the seven PMI equipment items to the stock level recommended by the linear program result in a cost of $10,121,100 dollars for 100 percent readiness. However, continuing with the strategy to maintain sixty days supply on hand requires a funding amount of $33,886,414 dollars in funding to reach 100 percent mission capability.

PMI costs may also be curtailed using cycle time management and/or establishing DRP relationships. These two concepts may be employed along with the linear program model or independently.

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V. CONCLUSIONS AND RECOMMENDATIONS

A. SUMMARY OF ANSWERS TO RESEARCH QUESTIONS

This thesis addressed five primary research questions:

1. Can the cost of readiness within the Aeromedical Evacuation System, Patient Movement Items Program, be reduced by either direct savings or procurement deferral?

AMC can defer costs associated with PMI readiness and realize cost savings. Initial inventory may be minimized using a simple Linear Programming Model. Starting inventory is calculated by using the AFMLO projected sixty-day demand, constrained by lead-time, manufacturer's production capacity and safety stock level. A variance of risk should be applied to account for abnormalities in expected demand. This thesis provided a margin of risk by requiring a five day safety stock. If the linear program using results are adopted, it would generate a $24,377,323 initial inventory cost deferment in the seven PMI items considered. However, initial inventories have already been purchased. If the optimal inventories are adopted for items not already in excess supply a cost deferment of $14,203,393 dollars will be achieved.

2. What is the primary mission of the Aeromedical Evacuation System and how is PMI integrated into this plan?

Risks are minimized by known lead-times and manufacturer's production capacity. Demand variability is one of the greatest threats, and adequate safety stock levels need to be analyzed to cover such variances. The casualty rates and

diagnosis projections are vital to planners when considering risk avoidance. Those counts are classified and unavailable to this research. The use of forecasting techniques like the Exponentially Weighted Moving Average (EWMA) will help avoid irregularities associated with unstable demand. Constant cycle time management will reduce risk associated with material flowing from receiving facilities in CONUS and returning to operations in the AE System. Risks and variances are inherent to all operations; logisticians must strive to minimize them.

3. What are the cost differences between the current strategy and a deferred strategy?

This research disclosed a cost of $46,266,145 dollars to procure 100 percent PMI equipment inventory over a six-year period. The research determined that if the minimum initial inventory is accepted, 100 percent readiness will be met by FY 00 for a total cost of $21,888,822 dollars. This is a cost difference of $24,377,323 dollars. The current strategy anticipates 100 percent readiness capability by FY 03, but has already experienced a $1.7 million funding shortfall.

4. Is the forecasted equipment requirement related to the number of dedicated AE lift assets?

Dedicated airlift is limited to 15 C-9A's. The average patient capacity for this airframe is 78 patients. Therefore, the maximum average number of patients evacuated at any one time is 1170. Each MASF and ASTS is pre-positioned with enough equipment to treat the facility's maximum patient capacity for up to 20

days. The answer to this question could not be definitively answered without casualty rate information which was unavailable for this research.

5. What determines PMI equipment as necessary technology in aeromedical patient care?

PMI technology is determined by the Joint Readiness Clinical Advisory Board (JRCAB), with significant influence from senior clinicians within that specialty. The requirement often is based on the latest technological advancements in each area, rather than meeting the basic requirements of quality care. Patients are evacuated to Echelon IV and V facilities, so the primary mission for PMI is to sustain life support. The benefits an additional unit of technology provides in sustaining life must be weighed carefully against its cost. This is an area where cost savings and cost containment may be significant.

B. CONCLUDING COMMENTS

This research has answered each research question. Furthermore, it has provided a process for identifying requirements more accurately and formulating a partnership with commercial manufacturers/vendors to save costs. DSCP continues to explore better business practices by establishing long-term arrangements with vendors and manufacturers. These innovative contracting mechanisms are the key component toward establishing readiness capabilities under surge conditions.

The era for large stock-piles and cachets of material being harbored in warehouses is vanishing. The Art of War is no longer conventional, but

unconventional. Adapting our military forces to this concept is the direction Joint Vision 2010, and Focused Logistics Doctrine is guiding DoD. As logistician and healthcare professionals, we must press the envelope, challenge the commercial marketplace, and support the service level our troops demand. This can be accomplished by employing better planning, innovative contracting, cooperative information sharing with commercial manufacturers and theater simulations.

C. ISSUES FOR FURTHER RESEARCH

1. Update demand in the contingency environment.

As weapons technology and military strategy evolve, casualty rates are likely to change. Casualty rates based on historic experience may not reflect current circumstances. Thus it is important to update the casualty data accumulated during a contingency. This wouls avoid over or under purchasing using past data that may be no longer relevant. An analysis of how demand is recorded and updated when contingency operations begin is invaluable to maintain available inventory, initiate purchases and reduce potential over-stock.

2. Evaluate if any transaction costs exist and the implications these cost weigh on the linear program purchase plan.

Transaction costs have not been identified or accounted for in this research. An analysis shouls consider whether DoD pays an ordering costs and what impact the total ordering cost has on the optimal purchasing plan.

3. AMC should evaluate TRACES 2 for application to PMI Equipment tracking.

AMC has invested $1.7 million dollars to purchase the PLEXUS tracking system for PMI items. TRANSCOM has devoted a considerable amount of appropriated funding to develop TRACES 2 for patient tracking. Both systems are designed to track PMI equipment items through the evacuation process. Maintaining two systems is redundant and costly. DoD should compare the qualities of each system and consider consolidating the PMI functions PLEXUS performs into the TRACES 2 system.

4. Coordinate through DSCP to establish a DRP contingency option specifically for PMI Equipment.

Aligning with manufacturers is imperative to realize cost saving through material deferment. Establishing long-term contractual relationships with direct information links reduces uncertainty, cost and inventory, it also provides more efficient service support.

5. Modify current PMI Program doctrine as an "in-kind" exchange of equipment to just support AE transport.

Clinically, there is little benefit gained by exchanging versus reconnecting life-supporting equipment at time of transport. Eliminating the "in-kind" exchange requirement will reduce the cycle time, PMI Center inventories and show immediate cost savings.

D. SUMMARY

This thesis has identified opportunities for further research, including: consolidating patient movement and inventory tracking systems and utilizing advanced simulation software to of determine medical requirements in theaters of operation. These initiatives, if analyzed more thoroughly, could provide DoD policy makers clearer insight for potential system-wide savings.

APPENDIX A. PATIENT MOVEMENT ITEMS

Patient Movement Items

The PMI focus is directed at 16 areas. Listed below are the items that have been identified as the critical assets requiring management under the PMI program. The generic items will have specific NSNs assigned as items become certified for aeromedical evacuation.

Item	NSN
1 - Defibrillator/Monitor, Portable	6515-01-354-3150, being upgraded to PhysioControl Lifepak 10-59
2 - Ventilator, Portable	6515-01-324-4516, changing from Bear 33 to new model (Impact 754M)
3 - Pulse Oximeter	6515-01-386-2978 (Nonin 8600)
4 - Vital Signs Monitor	6515-01-423-5872, being upgraded from Propaq 106EL to Propaq Encore
5 - Suction Apparatus, Continuous/Intermittent	6515-01-289-7311, Impact 308M being replaced by unit with intermittent capability
6 - Oxygen Analyzer, 9 Volt	6515-01-314-6721 (Miniox III) and a newer model
7 - Turning Frame, Orthopedic (Spinal Injury)	6530-00-680-0501 and 6530-00-706-0110, being deleted and replace by spinal cord injury transport system (SCITS)
8 - Traction Appliance, Cervical Injury	6530-00-926-4731
9 - Pump, Intravenous Infusion	6515-01-266-7461 MTP-1001A being replaced by unit with feeding capability
10 - Litter, Folding	6530-00-783-7905
11 - Mattress, Litter	6530-00-137-3016
12 - Rod, Intravenous-Irrigation Solution	6530-00-792-6000
13 - Strap, Webbing (Litter Straps)	6530-00-784-4205
14 - Restraint Set, Wrist and Ankle	6530-00-788-4010

15 - Blanket, Thermal, Cotton (1)	7210-00-139-5779
16 - Board, Spinal, Long (2)	6530-01-119-0012

Notes:

(1) Wool blankets may be substituted when approved.

(2) DMSB recommended change from short spinal board (6530-01-119-0011).

APPENDIX B. PATIENT EVACUATION CONTINGENCY KIT

Patient Evacuation Contingency Kit

40 Litters and litter pads

1 Restraint Sets

80 Litter Straps

4 Infusion Pumps

4 Ventilators

1 Turning Frame (Stryker) and cart

40 Blankets

40 IV Poles

8 Suction Machines

4 Vital Signs Monitors

4 Pulse Oximeters

1 Cardiac Defibrillator/Monitor

1 Traction Appliance, Cervical Injury

10 Spinal Boards

NOTE: PECK composition may change as patient streams are revised and analyzed.

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PMI Centers of Ownership

1 April 1999

Center #	Type	Function	Unit Tasked	Unit Location	FM Acct/Det	FM Location	Notes
001	PMI Center	AES	375 AES	Scott AFB IL	4407	Scott	
002	PMI Center	Warehouse	89 MDG	Andrews AFB MD	4425	Andrews	
003	PMI Center	Warehouse	60 MDG	Travis AFB CA	4427	Travis	14-22 Jun 99
004	PMI Center	AES	374 AES	Yokota AB JP	5202	Yokota	Sep-99
005	PMI Center	Warehouse	374 MDG	Yokota AB JP	5202	Yokota	Sep-99
006	PMI Center	Contingency	51 Con Hosp	Kimhae AB KO	5288	Kimhae	
007	PMI Center	AES	86 AES	Ramstein AB GE	5612	Ramstein	
008	PMI Center	Warehouse	86 MDG	Ramstein AB GE	5612	Ramstein	
009	PMI Center	Contingency	CENTAF	CENTAF	(none)	(none)	stored at 86 AES
010	PMI Center	Contingency	374 AES	Yokota AB JP	(none)	(none)	for AECC; Sep 99
011	PMI Center	Contingency	86 AES	Ramstein AB GE	(none)	(none)	for AECC
012	PMI Center	Contingency	TBD	USAFE	(none)	(none)	location TBD
013	PMI Center						
014	PMI Center						
015	PMI Center						
041	Unit Asset	Own/Training	349 AES	Travis AFB CA	4427/B	Travis	14-22 Jun 99
042	Unit Asset	Own/Training	459 AES	Andrews AFB MD	4425/C	Andrews	
043	Unit Asset	Own/Training	514 AES	McGuire AFB NJ	4439/F	McGuire	15-21 Aug 99
044	Unit Asset	Own/Training	714 AES	McGuire AFB NJ	4439/H	McGuire	15-21 Aug 99
045	Unit Asset	Own/Training	86 ASF	Landstuhl GE	5612/A	Ramstein	9-17 Mar 99
046	Unit Asset	Own/Training	622 AES	MacDill AFB FL	4814/B	MacDill	
047	Unit Asset	Own/Training	433 AES	Kelly AFB TX	2059/A	Kelly	
048	Unit Asset	Own/Training	439 AES	Westover ARB MA	2835/G	Hanscom	
049	Unit Asset	Own/Training	137 AES	Oklahoma City OK	2030/D	Tinker	ANG
050	Unit Asset	Own/Training	187 AES	Cheyenne WY	4613/C	F.E.Warren	ANG
051	Unit Asset	Own/Training	109 AES	Minneapolis-St Paul MN	4407/F	Scott	ANG; 28 Apr-3 May 99
052	Unit Asset	Own/Training	118 AES	Nashville TN	3022/C	Columbus	ANG; 1-4 Sep 99
053	Unit Asset	Own/Training	USAFSAM	Brooks AFB TX	2855/A	Brooks	
054	Unit Asset	Own/Training	142 AES	New Castle DE	4497/C	Dover	ANG; 4-7 Aug 99
055	Unit Asset	Own/Training	43 AES	Pope AFB NC	4488/B	Pope	
056	Unit Asset	Own/Training	156 AES	Charlotte NC	4803/D	Shaw	ANG; 29 Aug-1 Sep 99
057	Unit Asset	Own/Training	167 AES	Martinsburg WV	4425/H	Andrews	ANG; 1-4 Aug 99
058	Unit Asset	Own/Training	139 AES	Scotia NY	4439/N	McGuire	ANG
059	Unit Asset	Own/Training	146 AES	Channel Islands CA	4610/C	Vandenburg	ANG; 20-23 Jun 99

PMI Centers of Ownership

1 April 1999

060	Unit Asset	Own/Training	183 AES	Jackson MS	3022/B	Columbus	ANG
061	Unit Asset	Own/Training	315 AES	Charleston AFB SC	4418/B	Charleston	
062	Unit Asset	Own/Training	89 ASF	Andrews AFB MD	4425/A	Andrews	
063	Unit Asset	Own/Training	94 AES	Dobbins ARB GA	2060/C	Robins	
064	Unit Asset	Own/Training	908 AES	Maxwell AFB AL	3300/A	Maxwell	
065	Unit Asset	Own/Training	445 AES	Wright-Patterson AFB OH	2300/J	Wright-Pat	7-13 Apr 99
066	Unit Asset	Own/Training	446 AES	McChord AFB WA	4479/E	McChord	13-21 Apr 99
067	Unit Asset	Own/Training	934 AES	Minneapolis-St Paul MN	4659/E	Grand Forks	28 Apr-3 May 99
068	Unit Asset	Own/Training	452 AES	March ARB CA	6615	March	20-24 May 99
069	Unit Asset	Own/Training	911 AES	Pittsburgh PA	2300/X	Wright-Pat	3-7 Jun 99
070	Unit Asset	Own/Training	914 AES	Niagara Falls NY	2300/B	Wright-Pat	15-20 Jul 99
074	PMI Center	CCATT	74 MDG	Wright-Patterson AFB OH	2300	Wright-Pat	FY98 CCATT; 7-13 Apr 99
081	PMI Center	CCATT	81 MDG	Keesler AFB MS	3010	Keesler	FY98 CCATT; 10 May 99
082	PMI Center	CCATT	59 MW	Lackland AFB TX	3047	Lackland	FY98 CCATT
085	PMI Center	CCATT	86 MDG	Ramstein AB GE	5612	Ramstein	
086	PMI Center	CCATT	86 MDG	Ramstein AB GE	5612	Ramstein	
089	PMI Center	CCATT	89 MDG	Andrews AFB MD	4425	Andrews	FY98 CCATT
090	PMI Center	CCATT	374 MDG	Yokota AB JP	5202	Yokota	FY98 CCATT; Sept 99
092	PMI Center	CCATT	60 MDG	Travis AFB CA	4427	Travis	FY98 CCATT; 14-22 Jun 99
095	PMI Center	CCATT	48 MDG	RAF Lakenheath UK	5587	Lakenheath	FY98 CCATT
096	PMI Center	CCATT	96 MDG	Eglin AFB FL	2823	Eglin	FY98 CCATT, 11 May
098	PMI Center	CCATT	375 MDG	Scott AFB IL	4407	Scott	FY98 CCATT
099	PMI Center	CCATT	99 MDG	Nellis AFB NV	4852	Nellis	FY99 CCATT
102	PMI Center	CCATT	133 MDS	Minneapolis-St Paul MN	4407	Scott	FY99 CCATT
103	PMI Center	CCATT	934 ASTS	Minneapolis-St Paul MN	4659	Grand Forks	FY99 CCATT

PMI Centers of Ownership

1 April 1999

104	PMI Center	CCATT	433 ASTS	Kelly AFB TX	2059	Kelly	FY99 CCATT
105	PMI Center	CCATT	908 ASTS	Maxwell AFB AL	3300	Maxwell	FY99 CCATT
111	PMI Center	CCATT	514 ASTS	McGuire AFB NJ	4439	McGuire	FY99 CCATT
112	PMI Center	CCATT	932 ASTS	Scott AFB IL	4407	Scott	FY99 CCATT
116	PMI Center	CCATT	94 ASTS	Dobbins ARB GA	2060	Robins	FY99 CCATT
117	PMI Center	CCATT	10 MDG	USAFA CO	7000	USAFA	FY99 CCATT
120	PMI Center	CCATT	1 MDG	Langley AFB VA	4800	Langley	FY99 CCATT
301	WRM	AELT	86 AES	Ramstein AB GE	5612	Ramstein	
302	WRM	ADVON	374 AES	Yokota AB JP	5202/B	Yokota	Sep-99
303	WRM	ADVON	156 AES	Charlotte NC	4803/D	Shaw	29 Aug-1 Sep 99
304	WRM	AE Sup Cell	622 AES	MacDill AFB FL	4814/B	MacDill	
305	WRM	AE Sup Cell	439 AES	Westover ARB MA	2835/G	Hanscom	
306	WRM	AE Sup Cell	43 AES	Pope AFB NC	4488/B	Pope	
307	WRM	AE Sup Cell	375 AES	Scott AFB IL	4407	Scott	
308	WRM	AECC	375 AES	Scott AFB IL	4407	Scott	
309	WRM	AECM Cell	315 AES	Charleston AFB SC	4418/B	Charleston	
310	WRM	AECM Cell	433 AES	Kelly AFB TX	2059/A	Kelly	
311	WRM	AECM Cell	622 AES	MacDill AFB FL	4814/B	MacDill	
312	WRM	AECM Cell	452 AES	March ARB CA	6615/D	March	
313	WRM	AECM Cell	446 AES	McChord AFB WA	4479/E	McChord	
314	WRM	AECM Cell	514 AES	McGuire AFB NJ	4439/F	McGuire	15-21 Aug 99
315	WRM	AECM Cell	349 AES	Travis AFB CA	4427/B	Travis	14-22 Jun 99
316	WRM	AECM Cell	43 AES	Pope AFB NC	4488/B	Pope	
317	WRM	AECM Cell	375 AES	Scott AFB IL	4407	Scott	
318	WRM	AECM Cell	156 AES	Charlotte NC	4803/D	Shaw	29 Aug-1 Sep 99
319	WRM	AECM Cell	187 AES	Cheyenne WY	4613/C	F.E.Warren	
320	WRM	AECM Cell	167 AES	Martinsburg WV	4425/H	Andrews	
321	WRM	AEOT	315 AES	Charleston AFB SC	4418/B	Charleston	
322	WRM	AEOT	94 AES	Dobbins ARB GA	2060/C	Robins	

323	WRM	AEOT	452 AES	March ARB CA	6615/D	March	
324	WRM	AEOT	446 AES	McChord AFB WA	4479/E	McChord	
325	WRM	AEOT	934 AES	Minneapolis-St Paul MN	4659/E	Grand Forks	28 Apr-3 May 99
326	WRM	AEOT	914 AES	Niagara Falls NY	2300/B	Wright-Pat	
327	WRM	AEOT	183 AES	Jackson MS	3022/B	Columbus	
328	WRM	AEOT	167 AES	Martinsburg WV	4425/H	Andrews	
329	WRM	AEOT	137 AES	Oklahoma City OK	2030/D	Tinker	
330	WRM	AE Kits	914 AES	Niagara Falls NY	2300/B	Wright-Pat	10-15 Jul 99
331	WRM	AE Kits	911 AES	Pittsburgh PA	2300/X	Wright-Pat	3-7 Jun 99
332	WRM	AE Kits	452 AES	March ARB CA	6615/D	March	20-24 May 99
333	WRM	AE Kits	934 AES	Minneapolis-St Paul MN	4659/E	Grand Forks	28 Apr-3 May 99
334	WRM	AE Kits	446 AES	McChord AFB WA	4479/E	McChord	16-21 Apr 99
335	WRM	AE Kits	445 AES	Wright-Patterson AFB OH	2300/J	Wright-Pat	7-13 Apr 99
336	WRM	MASF	86 MDG	Ramstein AB GE	5612	Ramstein	
337	WRM	AE Kits	908 AES	Maxwell AFB AL	3300/A	Maxwell	26 Feb-1 Mar 99
338	WRM	AE Kits	94 AES	Dobbins ARB GA	2060/C	Robins	
339	WRM	AE Kits	315 AES	Charleston AFB SC	4418/B	Charleston	
340	WRM	AE Kits	183 AES	Jackson MS	3022/B	Columbus	
341	WRM	AE Kits	146 AES	Channel Islands CA	4610/C	Vandenberg	20-23 Jun 99
342	WRM	AELT	146 AES	Channel Islands CA	4610/C	Vandenberg	20-23 Jun 99
343	WRM	MASF	146 AES	Channel Islands CA	4610/C	Vandenberg	20-23 Jun 99
344	WRM	AE Kits	139 AES	Scotia NY	4439/H	McGuire	5-8 Mar 99
345	WRM	AELT	139 AES	Scotia NY	4439/H	McGuire	5-8 Mar 99
346	WRM	MASF	139 AES	Scotia NY	4439/H	McGuire	5-8 Mar 99
347	WRM	AE Kits	167 AES	Martinsburg WV	4425/H	Andrews	1-4 Aug 99
348	WRM	AELT	167 AES	Martinsburg WV	4425/H	Andrews	1-4 Aug 99
349	WRM	MASF	167 AES	Martinsburg WV	4425/H	Andrews	1-4 Aug 99
350	WRM	AE Kits	156 AES	Charlotte NC	4803/D	Shaw	29 Aug-1 Sep 99
351	WRM	AELT	156 AES	Charlotte NC	4803/D	Shaw	29 Aug-1 Sep 99
352	WRM	MASF	156 AES	Charlotte NC	4803/D	Shaw	29 Aug-1 Sep 99
353	WRM	AE Kits	43 AES	Pope AFB NC	4488/B	Pope	
354	WRM	ADVON	43 AES	Pope AFB NC	4488/B	Pope	
355	WRM	AELT	43 AES	Pope AFB NC	4488/B	Pope	
356	WRM	AECC	43 AES	Pope AFB NC	4488/B	Pope	
357	WRM	MASF	43 AES	Pope AFB NC	4488/B	Pope	
358	WRM	ADVON	142 AES	New Castle DE	4497/C	Dover	FY00; 4-7 Aug 99
359	WRM	AELT	142 AES	New Castle DE	4497/C	Dover	4-7 Aug 99

360	WRM	MASF	142 AES	New Castle DE	4497/C	Dover	4-7 Aug 99
361	WRM	AE Kits	142 AES	New Castle DE	4497/C	Dover	4-7 Aug 99
362	WRM	MASF	118 AES	Nashville TN	3022/C	Columbus	1-4 Sep 99
363	WRM	AELT	118 AES	Nashville TN	3022/C	Columbus	1-4 Sep 99
364	WRM	AE Kits	118 AES	Nashville TN	3022/C	Columbus	1-4 Sep 99
365	WRM	MASF	109 AES	Minneapolis-St Paul MN	4407/F	Scott	28 Apr-3 May 99
366	WRM	AELT	109 AES	Minneapolis-St Paul MN	4407/F	Scott	29 Apr-3 May 99
367	WRM	AE Kits	109 AES	Minneapolis-St Paul MN	4407/F	Scott	30 Apr-3 May 99
368	WRM	MASF	187 AES	Cheyenne WY	4613/C	F.E.Warren	
369	WRM	AELT	187 AES	Cheyenne WY	4613/C	F.E.Warren	
370	WRM	AE Kits	187 AES	Cheyenne WY	4613/C	F.E.Warren	
371	WRM	MASF	137 AES	Oklahoma City OK	2030/D	Tinker	
372	WRM	AELT	137 AES	Oklahoma City OK	2030/D	Tinker	
373	WRM	AE Kits	137 AES	Oklahoma City OK	2030/D	Tinker	
374	WRM	ADVON	439 AES	Westover ARB MA	2835/G	Hanscom	
375	WRM	AECC	439 AES	Westover ARB MA	2835/G	Hanscom	
376	WRM	AELT	439 AES	Westover ARB MA	2835/G	Hanscom	
377	WRM	AE Kits	439 AES	Westover ARB MA	2835/G	Hanscom	
378	WRM	MASF	439 AES	Westover ARB MA	2835/G	Hanscom	
379	WRM	MASF	433 AES	Kelly AFB TX	2059/A	Kelly	
380	WRM	AECC	433 AES	Kelly AFB TX	2059/A	Kelly	
381	WRM	ADVON	433 AES	Kelly AFB TX	2059/A	Kelly	
382	WRM	AELT	433 AES	Kelly AFB TX	2059/A	Kelly	
383	WRM	AE Kits	433 AES	Kelly AFB TX	2059/A	Kelly	
384	WRM	ADVON	622 AES	MacDill AFB FL	4814/B	MacDill	
385	WRM	AE Kits	622 AES	MacDill AFB FL	4814/B	MacDill	
386	WRM	MASF	622 AES	MacDill AFB FL	4814/B	MacDill	
387	WRM	AELT	622 AES	MacDill AFB FL	4814/B	MacDill	
388	WRM	AECC	622 AES	MacDill AFB FL	4814/B	MacDill	
389	WRM	AE Kit Hub	60 MDG	Travis AFB CA	4427	Travis	14-22 Jun 99
390	WRM	AE Kit Hub	62 MDG	McChord AFB WA	4479	McChord	for redistribution ??
391	WRM	AE Kit Hub	89 MDG	Andrews AFB MD	4425	Andrews	to Charleston ??
392	WRM	AE Kit Hub	305 MDG	McGuire AFB NJ	4439	McGuire	15-21 Aug 99
393	WRM	AE Kits	459 AES	Andrews AFB MD	4425/C	Andrews	
394	WRM	AE Kits	514 AES	McGuire AFB NJ	4439/F	McGuire	15-21 Aug 99
395	WRM	AE Kits	714 AES	McGuire AFB NJ	4439/H	McGuire	15-21 Aug 99
396	WRM	AE Kits	86 AES	Ramstein AB GE	5612	Ramstein	9-17 Mar 99

397	WRM	AE Kits	349 AES	Travis AFB CA	4427/B	Travis	14-22 Jun 99
398	WRM	MASF	374 AES	Yokota AB JP	5202/B	Yokota	Sep-99
399	WRM	AE Kits	374 AES	Yokota AB JP	5202/B	Yokota	Sep-99

PMI Projected Budget Plan

	FY98 - 27% Actual Capability	FY99 - 32% Actual Capability	FY00 - 47% Estimated Capability	FY01 - 64% Estimated Capability	FY02 - 86% Estimated Capability	FY03 - 100% Estimated Capability	Total
POM Submission	$10,023,000.00	$9,275,000.00	$9,535,000.00	$9,802,000.00	$10,075,000.00	$10,359,000.00	$59,069,000.00
Expected Funding	$6,980,000.00	$6,980,000.00	$8,864,000.00	$9,130,000.00	$11,430,000.00	$9,517,000.00	$52,901,000.00
Actual Funding	$13,650,000.00	$3,025,224.00					$16,675,224.00
Estimated Cumulative Funding	$6,980,000.00	$13,960,000.00	$22,824,000.00	$31,954,000.00	$43,384,000.00	$52,901,000.00	
Actual Cummulative Funding	$13,650,000.00	$16,675,224.00					
Diff Between Actual/Expected Funding	$6,670,000.00	$2,715,224.00					
Amount Needed to Buy Out							$36,225,776.00
	Actual	***Actual***	***Projected***	***Projected***	***Projected***	***Projected***	***Projected***
PMI Equipment	$12,900,000.00	$2,366,182.00	$7,715,527.00	$8,164,721.00	$10,981,862.00	$6,650,980.00	$48,779,272.00
PMI Durables	$111,000.00	$0.00	$85,008.00	$120,624.00	$214,417.00	$374,776.00	$905,825.00
Test Equipment	$131,000.00	$0.00	$65,441.00	$71,437.00	$92,438.00	$73,760.00	$434,076.00
Spare Parts	$100,000.00	$180,620.00	$182,000.00	$0.00	$0.00	$0.00	$462,620.00
Testing WP	$161,000.00	$236,422.00	$75,000.00	$0.00	$0.00	$0.00	$472,422.00
USARRL Testing Army	$0.00	$0.00	$175,000.00	$175,000.00	$0.00	$0.00	$350,000.00
AMC Program Management	$142,000.00	$142,000.00	$142,000.00	$0.00	$0.00	$142,000.00	$568,000.00
Warehouse Ramstein	$105,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$105,000.00
Plexus	$0.00	$0.00	$323,000.00	$459,830.00	$0.00	$0.00	$782,830.00
Initial Outfitting Travis	$0.00	$100,000.00	$100,000.00	$0.00	$0.00	$0.00	$200,000.00
Totals	**$13,650,000.00**	**$3,025,224.00**	**$8,862,976.00**	**$9,133,612.00**	**$11,430,717.00**	**$9,607,698.00**	**$53,060,045.00**

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PMI Acquisition Totals

Item	Quantity	Total Procured	% Procured	Andrews	Travis	SWA	Ramstein/Yokota/Korea	Unit Cost	Total Cost	% of Reqmt	Notes
Ventilator	1,078	174	16.14%	162	162	323	431	8,000	8,624,000	100	
Oxygen Analyzer	1,359	175	12.88%	204	204	408	543	587	797,733	100	
IV Pump	1,100	113	10.27%	165	165	330	440	1,300	1,430,000	100	from 838 to 1100
CISU	2,050	267	13.02%	307	307	615	821	676	1,385,800	100	from 2009 to 2050
Vital Signs Monitor	3,414	452	13.24%	512	512	1,024	1,366	6,768	23,105,952	100	
Pulse Oximeter	1,300	174	13.38%	195	195	390	520	1,365	1,774,500	100	
Defibrillator	1,280	165	12.89%	192	192	384	512	7,147	9,148,160	100	
Litters	10,100			1,515	1,515	3,030	4,040	100	1,010,000	100	100% from excess
Litter Pads	10,100			1,515	1,515	3,030	4,040	27	272,700	100	45% from excess
Litter Straps	20,200			3,030	3,030	6,060	8,080	15	303,000	100	100% from excess
IV Poles	10,100			1,515	1,515	3,030	4,040	28	282,800	100	6% from excess
Blankets	10,100			1,515	1,515	3,030	4,040	13	131,300	100	48% from excess
Retraint Sets	1,250			188	188	374	500	138	172,500	100	72% from excess
Stryker Frames	13			2	2	4	5	1,036	13,468	100	100% from excess
Traction Appliance	42			6	6	13	17	921	38,682	100	100% from excess
SCITS	29			4	4	9	12	1,700	49,300	100	
Spine Board	36			5	5	11	15	104	3,744	100	
Ventilator Tester	17			2	2	5	8	7,950	135,150	100	
Cardiac Signal Gen	48			6	6	14	22	1,395	66,960	100	
Dynatech Nevada	14			2	2	5	6	1,495	20,930	100	
Pulse Ox Tester	18			2	2	6	8	450	8,100	100	
Pacer 4000 (Defib)	18			2	2	6	8	2,495	44,910	100	
Medical Tester 5000B	18			2	2	6	8	4,695	84,510	100	
Spare Parts	6							660,000	3,960,000		
Consumables	6							100,000	600,000		
Other	6							167,000	1,002,000		
Gross Total									54,466,199		
From Excess									-1,726,794		
Net TOTAL									52,739,405		

FY 98 PMI Acquisition

Item	Quantity	Actual Qty	Proj Andrews	Actual	Proj Travis	Actual	Proj Ramstein/SWA	Actual	Proj Yokota/Korea	Actual
Ventilator	142	174	28		0		34 / 16		60 / 4	
Oxygen Analyzer	179	175	36		0		47 / 16		76 / 4	
IV Pump	154	113	35		0		36 / 16		63 / 4	
CISU	272	267	55		0		63 / 32		114 / 8	
Vital Signs Monitor	450	452	100		0		134 / 16		196 / 4	
Pulse Oximeter	172	174	35		0		44 / 16		73 / 4	
Defibrillator	169	165	33		0		44 / 16		72 / 4	
Litters (10,100)	10,100		1,515		1,515		2870 / 160		4000 / 40	
Litter Pads (10,100)	5,534		800		1,515		840 / 160		2179 / 40	
Litter Straps (20,200)	20,200		3,030		3,030		5740 / 320		8000 / 80	
IV Poles (10,100)	571		100		100		60 / 40		231 / 40	
Blankets (10,100)	4,804		1,515		1,515		340 / 160		234 / 40	
Retraint Sets	897		91		91		310 / 4		400 / 1	
Stryker Frames	13		2		2		4		5	
Traction Appliance	42		6		6		13		17	
SCITS	0									
Spine Board	0									
Ventilator Tester	5		1		1		1		2	
Cardiac Signal Gen	8		1		1		2		4	
Dynatech Nevada	5		1		1		1		2	
Pulse Ox Tester	5		1		1		1		2	
Pacer 4000 (Defib)	5		1		1		1		2	
Medical Tester 5000B	5		1		1		1		2	
Spare Parts	1									
Consumables	1									
Other	1									
Gross Total										
From Excess										
NET TOTAL FY 98										

Unit Cost	Total Cost	% of Reqmt	Notes
8,000	1,136,000	13	
587	105,073	13	
1,300	200,200	13	
676	183,872	13	
6,768	3,045,600	13	
1,365	234,780	13	
7,147	1,207,843	13	
100	1,010,000	100	excess
27	149,418	55	excess
15	303,000	100	excess
28	15,988	6	excess
13	62,452	48	excess
138	123,786	72	excess
1,036	13,468	31	excess
921	38,682	100	excess
1,700	0	0	item being developed
104	0	0	
	0		
7,950	39,750	29	
1,395	11,160	17	
1,495	7,475	36	
450	2,250	28	
2,495	12,475	28	
4,695	23,475	28	
660,000	660,000		
100,000	100,000		
167,000	167,000		
	8,853,747		
	-1,726,794		
	7,126,953		

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FY 99 PMI Acquisition

Item	Quantity	Andrews	Travis	Ramstein/SWA	Yokota/Korea	Unit Cost	Total Cost	% of Reqmt	Notes
Ventilator	142	28	0	50	64	8,000	1,136,000	26	13% net buy
Oxygen Analyzer	179	36	0	63	80	587	105,073	26	13% net buy
IV Pump	154	35	0	52	67	1,300	200,200	26	13% net buy
CISU	272	54	0	96	122	676	183,872	26	13% net buy
Vital Signs Monitor	450	100	0	150	200	6,768	3,045,600	26	13% net buy
Pulse Oximeter	172	35	0	60	77	1,365	234,780	26	13% net buy
Defibrillator	169	33	0	60	76	7,147	1,207,843	26	13% net buy
Litters (10,100)	0					100	0	100	
Litter Pads (10,100)	4,566	715	0	2,030	1,821	27	123,282	100	
Litter Straps (20,200)	0					15	0	100	
IV Poles (10,100)	9,529	1,415	1,415	2,930	3,769	28	266,812	100	
Blankets (10,100)	5,296	715	0	2,030	2,551	13	68,848	100	
Retraint Sets	353	97	97	60	99	138	48,714	100	
Stryker Frames	0					1,036	0	31	see SCITS
Traction Appliance	0					921	0	100	
SCITS	0					1,700	0	0	item being developed
Spine Board	36	5	5	11	15	104	3,744	100	
Ventilator Tester	1	0	0	1	0	7,950	7,950	35	6% net buy
Cardiac Signal Gen	6	1	1	2	2	1,395	8,370	29	12% net buy
Dynatech Nevada	0	0	0	0	0	1,495	0	36	
Pulse Ox Tester	3	0	0	1	2	450	1,350	44	16% net buy
Pacer 4000 (Defib)	3	0	0	1	2	2,495	7,485	44	16% net buy
Medical Tester 5000B	3	0	0	1	2	4,695	14,085	44	16% net buy
							0		
Spare Parts	1					660,000	660,000		
Consumables	1					100,000	100,000		
Other	1					167,000	167,000		
							0		
							0		
							0		
TOTAL FY 99							7,591,008		

FY 00 PMI Acquisition

Item	Quantity	Andrews	Travis	Ramstein/SWA	Yokota/Korea	Unit Cost	Total Cost	% of Reqmt	Notes
Ventilator	181	18	75	38	50	8,000	1,448,000	43	17% net buy
Oxygen Analyzer	228	24	96	46	62	587	133,836	43	17% net buy
IV Pump	183	18	86	33	46	1,300	237,900	43	17% net buy
CISU	344	35	144	70	95	676	232,544	43	17% net buy
Vital Signs Monitor	572	55	255	112	150	6,768	3,871,296	43	17% net buy
Pulse Oximeter	218	22	92	45	59	1,365	297,570	43	17% net buy
Defibrillator	214	22	88	45	59	7,147	1,529,458	43	17% net buy
Litters (10,100)	0					100	0	100	
Litter Pads (10,100)	0					27	0	100	
Litter Straps (20,200)	0					15	0	100	
IV Poles (10,100)	0					28	0	100	
Blankets (10,100)	0					13	0	100	
Retraint Sets	0					138	0	100	
Stryker Frames	0					1,036	0	100	
Traction Appliance	0					921	0	100	
SCITS	29	4	4	9	12	1,700	49,300	100	
Spine Board	0					104	0	100	
Ventilator Tester	2	0	0	0	2	7,950	15,900	41	6% net buy
Cardiac Signal Gen	8	1	1	2	4	1,395	11,160	46	17% net buy
Dynatech Nevada	3	0	0	1	2	1,495	4,485	57	21% net buy
Pulse Ox Tester	1	0	0	1	0	450	450	50	6% net buy
Pacer 4000 (Defib)	1	0	0	1	0	2,495	2,495	50	6% net buy
Medical Tester 5000B	1	0	0	1	0	4,695	4,695	50	6% net buy
Spare Parts	1					660,000	660,000		
Consumables	1					100,000	100,000		
Other	1					167,000	167,000		
TOTAL FY 00							8,766,089		

FY 01 PMI Acquisition

Item	Quantity	Andrews	Travis	Ramstein/SWA	Yokota/Korea	Unit Cost	Total Cost	% of Reqmt	Notes
Ventilator	186	28	28	56	74	8,000	1,488,000	60	17% net buy
Oxygen Analyzer	235	35	35	71	94	587	137,945	60	17% net buy
IV Pump	191	29	29	57	76	1,300	248,300	60	17% net buy
CISU	353	53	53	106	141	676	238,628	60	17% net buy
Vital Signs Monitor	589	88	88	177	236	6,768	3,986,352	60	17% net buy
Pulse Oximeter	224	33	33	68	90	1,365	305,760	60	17% net buy
Defibrillator	221	32	32	67	90	7,147	1,579,487	60	17% net buy
Litters (10,100)	0					100	0	100	
Litter Pads (10,100)	0					27	0	100	
Litter Straps (20,200)	0					15	0	100	
IV Poles (10,100)	0					28	0	100	
Blankets (10,100)	0					13	0	100	
Retraint Sets	0					138	0	100	
Stryker Frames	0					1,036	0	100	
Traction Appliance	0					921	0	100	
SCITS	0					1,700	0	100	
Spine Board	0					104	0	100	
Ventilator Tester	1	0	0	1	0	7,950	7,950	53	12% net buy
Cardiac Signal Gen	9	1	1	3	4	1,395	12,555	65	19% net buy
Dynatech Nevada	1	0	0	1	0	1,495	1,495	64	7% net buy
Pulse Ox Tester	5	1	1	1	2	450	2,250	78	28% net buy
Pacer 4000 (Defib)	5	1	1	1	2	2,495	12,475	78	28% net buy
Medical Tester 5000B	5	1	1	1	2	4,695	23,475	78	28% net buy
							0		
Spare Parts	1					660,000	660,000		
Consumables						100,000	100,000		
Other	1					167,000	167,000		
							0		
							0		
							0		
TOTAL FY 01							8,971,672		

FY 02 PMI Acquisition

Item	Quantity	Andrews	Travis	Ramstein/SWA	Yokota/Korea	Unit Cost	Total Cost	% of Reqmt	Notes
Ventilator	233	35	35	70	93	8,000	1,864,000	82	22% net buy
Oxygen Analyzer	294	44	44	89	117	587	172,578	82	22% net buy
IV Pump	228	34	34	68	92	1,300	296,400	82	22% net buy
CISU	441	66	66	132	177	676	298,116	82	22% net buy
Vital Signs Monitor	738	110	110	222	296	6,768	4,994,784	82	22% net buy
Pulse Oximeter	281	41	41	85	112	1,365	383,565	82	22% net buy
Defibrillator	277	42	42	83	110	7,147	1,979,719	82	22% net buy
Litters (10,100)	0					100	0	100	
Litter Pads (10,100)	0					27	0	100	
Litter Straps (20,200)	0					15	0	100	
IV Poles (10,100)	0					28	0	100	
Blankets (10,100)	0					13	0	100	
Retraint Sets	0					138	0	100	
Stryker Frames	0					1,036	0	100	
Traction Appliance	0					921	0	100	
SCITS	0					1,700	0	100	
Spine Board	0					104	0	100	
							0		
Ventilator Tester	5	1	1	1	2	7,950	39,750	82	29% net buy
Cardiac Signal Gen	9	1	1	3	4	1,395	12,555	83	18% net buy
Dynatech Nevada	4	1	1	0	2	1,495	5,980	93	29% net buy
Pulse Ox Tester	3	0	0	1	2	450	1,350	94	16% net buy
Pacer 4000 (Defib)	3	0	0	1	2	2,495	7,485	94	16% net buy
Medical Tester 5000B	3	0	0	1	2	4,695	14,085	94	16% net buy
Spare Parts	1					660,000	660,000		
Consumables	1					100,000	100,000		
Other	1					167,000	167,000		
							0		
							0		
							0		
TOTAL FY 02							10,997,367		

FY 03 PMI Acquisition

Item	Quantity	Andrews	Travis	Ramstein/SWA	Yokota/Korea	Unit Cost	Total Cost	% of Reqmt	Notes
Ventilator	194	25	24	59	86	8,000	1,552,000	100	18% net buy
Oxygen Analyzer	244	29	29	76	110	587	143,228	100	18% net buy
IV Pump	190	14	16	68	92	1,300	247,000	100	18% net buy
CISU	368	50	50	128	140	676	248,768	100	18% net buy
Vital Signs Monitor	614	59	59	213	284	6,768	4,155,552	100	18% net buy
Pulse Oximeter	234	29	29	72	104	1,365	319,410	100	18% net buy
Defibrillator	230	30	30	69	101	7,147	1,643,810	100	18% net buy
Litters (10,100)	0					100	0	100	
Litter Pads (10,100)	0					27	0	100	
Litter Straps (20,200)	0					15	0	100	
IV Poles (10,100)	0					28	0	100	
Blankets (10,100)	0					13	0	100	
Retraint Sets	0					138	0	100	
Stryker Frames	0					1,036	0	100	
Traction Appliance	0					921	0	100	
SCITS	0					1,700	0	100	
Spine Board	0					104	0	100	
Ventilator Tester	3	0	0	1	2	7,950	23,850	100	18% net buy
Cardiac Signal Gen	8	1	1	2	4	1,395	11,160	100	17% net buy
Dynatech Nevada	1	0	0	1	0	1,495	1,495	100	7% net buy
Pulse Ox Tester	1	0	0	1	0	450	450	100	6% net buy
Pacer 4000 (Defib)	1	0	0	1	0	2,495	2,495	100	6% net buy
Medical Tester 5000B	1	0	0	1	0	4,695	4,695	100	6% net buy
Spare Parts	1					660,000	660,000		
Consumables	1					100,000	100,000		
Other	1					167,000	167,000		
TOTAL FY 03							9,280,913		

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PMI Total Authorized Quantities By Location

Item	*NSN*	*Total Program*	*Program Quantities Andrews FM4425*	*Program Quantities Yokota FM5202*	*Program Quantities Ramstein FM5612*	*Program Quantities Travis FM4427*
Durables						
Folding Litter	6530-00-783-7905	10,100	1,515	4,040	3,030	1,515
Folding Replacement for when 6530-00-783-7905 is exhausted	6530-01-380-7309					
Litter, Pads	6530-00-137-3016	10,100	1,515	4,040	3,030	1,515
Litter, Straps	6530-00-784-4205	20,200	3,030	8,080	6,060	3,030
Rod, IV	6530-00-792-6000	10,100	1,515	4,040	3,030	1,515
Blankets	7210-00-139-5779	10,100	1,515	4,040	3,030	1,515
Restraint Set	6530-00-788-4010	1,250	188	500	374	188
Turning Frame	6530-00-680-0501	42	6	17	13	6
Traction Appliance	6530-00-926-4731	42	6	17	13	6
Spine Board	6530-01-119-0012	36	5	15	11	5
Equipment						
Ventilator- IMPACT 754M- Fixed Wing Flight Certified	6530-01-455-1653L	1,078	162	431	323	162
Oxygen Analyzer-MiniOx 3000- Fixed Wing Flight Certified	6515-01-440-9394L	1,359	204	543	408	204
Infusion Pump-Alaris MS III- Fixed Wing Flight Certified	6515-01-452-0625J	1,100	165	440	330	165
Suction Pump-IMPACT 326M Fixed Wing Flight Certified	6515-01-435-0050L	2,050	307	821	615	307
Vital Signs Monitor-Propaq 206EL/SP02 /EM - Fixed Wing Flight Certified	6515-01-432-2707L	2,336	350	935	701	350
Vital Signs Monitor-Propaq 206EL/SP02 /EM CO2 with Capnography - Fixed Wing Flight Certified	6515-01-432-2707L	1,078	162	431	323	162
Pulse Oximeter-BCI 3303- Fixed Wing Flight Certified	6515-01-452-7697L	1,300	195	520	390	195
Defibrillator-Physio Control Lifepak 10-59- Fixed Wing Flight Certified	6515-01-451-9872J	1,280	192	512	384	192

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Item	*NSN*	*Total Program*	*Program Quantities Andrews FM4425*	*Program Quantities Yokota FM5202*	*Program Quantities Ramstein FM5612*	*Program Quantities Travis FM4427*
Test Equipment						
Fluke 105B Oscilloscope	6625-01-458-7997	17	2	8	5	2
Biotek Multiparameter Simulator Lionheart 3	6625L-BIOTEKLH3	48	6	22	14	6
DNI 4000 Defib Analyzer	6515-01-449-1420	14	2	6	5	2
Allied Respical T-300 Calibration Analyzer	6625L-RESPT300	18	2	8	6	2
Biotek Multichannel Infusion Device Analyzer IDA-4	6625L-BIOTEKIDA4	18	2	8	6	2
DNI 5000C Medtester	6625L-DNI5000C	18	2	8	6	2
Spare Parts						
Spare Parts Kit for 206EL/SP02/EM Vital Signs Monitor (NS1)	6545L-206ELKIT	6	1	2	2	1
Spare Parts Kit for Lifpak 10-59 (LP10KITA)	6545L-LP10KIT	6	1	2	2	1
Spare Parts Kit for Impact 754M Portable Ventilator (714-0754-01)	6545L-754MKIT	6	1	2	2	1
Spare Part Kit Alaris MS III IV Pump	6545L-MS3KIT	6	1	2	2	1
Spare Parts Kit for Impact 326M Suction Unit (714-0326-01)	6545L-326MKIT	6	1	2	2	1

PMI Total Authorized Quantities By Location

Item	*NSN*	*Total Program*	*Program Quantities Andrews FM4425*	*Program Quantities Yokota FM5202*	*Program Quantities Ramstein FM5612*	*Program Quantities Travis FM4427*
Test Equipment						
Fluke 105B Oscilloscope	6625-01-458-7997	17	2	8	5	2
Biotek Multiparameter Simulator Lionheart 3	6625L-BIOTEKLH3	48	6	22	14	6
DNI 4000 Defib Analyzer	6515-01-449-1420	14	2	6	5	2
Allied Respical T-300 Calibration Analyzer	6625L-RESPT300	18	2	8	6	2
Biotek Multichannel Infusion Device Analyzer IDA-4	6625L-BIOTEKIDA4	18	2	8	6	2
DNI 5000C Medtester	6625L-DNI5000C	18	2	8	6	2
Spare Parts						
Spare Parts Kit for 206EL/SP02/EM Vital Signs Monitor (NS1)	6545L-206ELKIT	6	1	2	2	1
Spare Parts Kit for Lifpak 10-59 (LP10KITA)	6545L-LP10KIT	6	1	2	2	1
Spare Parts Kit for Impact 754M Portable Ventilator (714-0754-01)	6545L-754MKIT	6	1	2	2	1
Spare Part Kit Alaris MS III IV Pump	6545L-MS3KIT	6	1	2	2	1
Spare Parts Kit for Impact 326M Suction Unit (714-0326-01)	6545L-326MKIT	6	1	2	2	1

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APPENDIX H. TREATMENT BRIEFS INDEX

TREATMENT BRIEFS INDEX

PC	PC TITLE
000	NOT PRESENTLY PER PATIENT DRIVEN
001	CEREBRAL CONCUSSION CLOSED WITH/WITHOUT NONDEPRESSED LINEAR SKULL FRACTURE SEVERE - LOSS OF CONSCIOUSNESS FROM 2 TO 12 HO
002	CEREBRAL CONCUSSION CLOSED WITH/WITHOUT NONDEPRESSED LINEAR SKULL FRACTURE MODERATE - LOSS OF CONSCIOUSNESS LESS THAN 2
003	CEREBRAL CONTUSION CLOSED WITH/WITHOUT NONDEPRESSED LINEAR SKULL FRACTURE SEVERE - LOSS OF CONSCIOUSNESS GREATER THAN 24 WITH FOCAL NEUROLOGICAL DEFICIT
004	CEREBRAL CONTUSION CLOSED WITH/WITHOUT NONDEPRESSED LINEAR SKULL FRACTURE MODERATE - LOSS OF CONSCIOUSNESS FROM 12-24 HC WITHOUT FOCAL NEUROLOGICAL DEFICIT
005	CEREBRAL CONTUSION CLOSED WITH INTRACRANIAL HEMATOMA WITH/WITHOUT NON- DEPRESSED LINEAR SKULL FRACTURE - SEVERE - LARGE HEMATOMA (INCLUDING EPIDURAL HEMATOMA) WITH RAPIDLY DETERIORATING COMATOSE PATI
006	CEREBRAL CONTUSION CLOSED WITH NONDEPRESSED LINEAR SKULL FACTURE SEVERE - LOSS OF CONSCIOUSNESS GREATER THAN 24 HOURS WITH/WITHOUT FOCAL NEUROLOGICAL DEFICIT
007	CEREBRAL CONTUSION CLOSED WITH DEPRESSED SKULL FRACTURE SEVERE - WITH ASSOCIATED INTRACEREBRAL HEMATOMA AND/OR MASSIVI DEPRESSION
008	CEREBRAL CONTUSION CLOSED WITH DEPRESSED SKULL FRACTURE MODERATE - NO ASSOCIATED HEMATOMA OR SIGNIFICANT EFFECT FROM DEPRESSION
009	CEREBRAL CONTUSION WITH OPEN SKULL FRACTURE SEVERE - WITH INTRACRANIAL FRAGMENTS AND/OR DEPRESSED SKULL FRACTURE; EYELID EYEBALL LACERATION WITH RETAINED INTRAOCULAR FOREIGN BODY
010	CEREBRAL CONTUSION WITH OPEN SKULL FRACTURE MODERATE - WITHOUT INTRACRANIAL FRAGMENTS AND/OR DEPRESSED SKULL FRACTURE
011	INTRACRANIAL HEMORRHAGE SPONTANEOUS NONTRAUMATIC ALL CASES
012	[redacted]
013	WOUND SCALP OPEN WITHOUT CEREBRAL INJURY OR SKULL FRACTURE SEVERE - SCALPED WITH AVULSION OF TISSUE
014	WOUND SCALP OPEN WITHOUT CEREBRAL INJURY OR SKULL FRACTURE MODERATE - SCALP LACERATION
015	FRACTURE FACIAL BONES CLOSED EXCLUSIVE OF MANDIBLE SEVERE - MULTIPLE FRACTURES
016	FRACTURE FACIAL BONES CLOSED EXCLUSIVE OF MANDIBLE MODERATE - SINGLE FRACTURE
017	WOUND FACE JAWS AND NECK OPEN LACERATED WITH ASSOCIATED FRACTURES EXCLUDING SPINAL FRACTURES SEVERE - WITH AIRWAY OBSTRUCTION
018	WOUND FACE JAWS AND NECK OPEN LACERATED WITH ASSOCIATED FRACTURES EXCLUDING SPINAL FRACTURES MODERATE - WITHOUT AIR' OBSTRUCTION; EYELID AND EYEBALL LACERATION WITH RETAINED INTRAOCULAR FOREIG
019	WOUND FACE AND NECK OPEN LACERATED CONTUSED WITHOUT FRACTURES SEVERE - WITH AIRWAY OBSTRUCTIONS AND/OR MAJOR VESSEL INVOLVEMENT
020	WOUND FACE AND NECK OPEN LACERATED CONTUSED WITHOUT FRACTURES MODERATE - WITHOUT AIRWAY OBSTRUCTION OR MAJOR VESSE INVOLVEMENT
021	EYE WOUND SEVERE - LOSS OF INTRAOCULAR FLUID WITH/WITHOUT RETINAL DETACHMENT, WITH SEVERE LID LACERATION, EYE NOT SALVAGE/
022	EYE WOUND LACERATED MODERATE - WITHOUT RETINAL DETACHMENT OR RETINAL INJURY NO FOREIGN BODY RETAINED WITHOUT LOSS OF VITREOUS FLUID PATIENT HAS HYPHEMA EYE SALVAGEABLE
023	HEARING IMPAIRMENT SEVERE
024	HEARING IMPAIRMENT MODERATE
025	FRACTURE SPINE CLOSED WITHOUT CORD DAMAGE UNSTABLE LESION
026	FRACTURE SPINE CLOSED WITHOUT CORD DAMAGE STABLE LESION
027	FRACTURE SPINE CLOSED WITH CORD DAMAGE CERVICAL SPINE WITH RESPIRATORY INVOLVEMENT
028	FRACTURE SPINE CLOSED WITH CORD DAMAGE BELOW CERVICAL SPINE (PROGRESSIVE)
029	FRACTURE SPINE OPEN WITH CORD DAMAGE CERVICAL SPINE WITH RESPIRATORY DISTRESS
030	FRACTURE SPINE OPEN WITH CORD DAMAGE BELOW CERVICAL SPINE (PROGRESSIVE)
031	INTERVERTEBRAL DISC DISORDERS WITH NERVE ROOT COMPRESSION RESISTANT TO BED REST/TRACTION
032	INTERVERTEBRAL DISC DISORDERS WITH NERVE ROOT COMPRESSION RESPONDING TO BED REST/TRACTION
033	STRAINS AND SPRAINS SACROILIAC REGION SEVERE - NON-AMBULATORY
034	STRAINS AND SPRAINS SACROILIAC REGION MODERATE - AMBULATORY
035	BURN THERMAL SUPERFICIAL HEAD AND NECK GREATER THAN 5% BUT LESS THAN 10% OF TOTAL BODY AREA AND/OR EYE INVOLVEMENT
036	BURN THERMAL SUPERFICIAL HEAD AND NECK LESS THAN 5% OF TOTAL BODY AREA AND NO EYE INVOLVEMENT
037	BURN THERMAL PARTIAL THICKNESS HEAD AND NECK GREATER THAN 5% BUT LESS THAN 10% OF TOTAL BODY AREA AND/OR EYE INVOLVEMI
038	BURN THERMAL PARTIAL THICKNESS HEAD AND NECK LESS THAN 5% OF TOTAL BODY AREA AND NO EYE INVOLVEMENT
039	BURN THERMAL FULL THICKNESS HEAD AND NECK GREATER THAN 5% BUT LESS THAN 10% OF TOTAL BODY AREA WITH EYE INVOLVEMENT
040	BURN THERMAL FULL THICKNESS HEAD AND NECK LESS THAN 5% OF TOTAL BODY AREA AND NO EYE INVOLVEMENT
041	FRACTURE CLAVICLE CLOSED ALL CASES
042	WOUND SHOULDER GIRDLE OPEN WITH BONE INJURY SEVERE - JOINT INVOLVEMENT
043	WOUND SHOULDER GIRDLE OPEN WITH BONE INJURY MODERATE - NO JOINT INVOLVEMENT
044	FRACTURE HUMERUS CLOSED UPPER SHAFT ALL CASES
045	WOUND UPPER ARM OPEN PENETRATING LACERATED WITHOUT FRACTURE SEVERE - WITH NERVE AND/OR VASCULAR INJURY
046	WOUND UPPER ARM OPEN PENETRATING LACERATED WITHOUT FRACTURE MODERATE - WITHOUT NERVE OR VASCULAR INJURY
047	WOUND UPPER ARM OPEN WITH FRACTURES AND NERVE AND VASCULAR INJURY ARM NON-SALVAGEABLE
048	WOUND UPPER ARM OPEN WITH FRACTURES AND NERVE INJURY NO VASCULAR INJURY ARM SALVAGEABLE
049	FRACTURE RADIUS AND ULNA CLOSED SEVERE - SHAFTS OF BONES
050	FRACTURE RADIUS AND ULNA CLOSED MODERATE - COLLES FRACTURE
051	WOUND FOREARM OPEN LACERATED PENETRATING WITHOUT BONE NERVE OR VASCULAR INJURY WITH MAJOR LOSS OF MUSCLE TISSUE SE\ REQUIRING MAJOR DEBRIDEMENT
052	WOUND FOREARM OPEN LACERATED PENETRATING WITHOUT BONE NERVE OR VASCULAR INJURY MODERATE - NOT REQUIRING MAJOR DEBRIDEMENT
053	WOUND FOREARM OPEN LACERATED PENETRATING WITH FRACTURE AND WITH NERVE AND VASCULAR INJURY FOREARM NOT SALVAGEABLI
054	WOUND FOREARM OPEN LACERATED PENETRATING WITH FRACTURE AND WITH NERVE AND VASCULAR INJURY FOREARM SALVAGEABLE

055 FRACTURE HAND OR FINGERS CLOSED SEVERE - REQUIRING OPEN REDUCTION
056 FRACTURE HAND AND/OR FINGERS CLOSED MODERATE - NOT REQUIRING CLOSED REDUCTION
057 WOUND HAND AND/OR FINGERS OPEN LACERATED WITHOUT FRACTURES SEVERE - SUPERFICIAL AND DEEP TENDON INVOLVEMENT
058 WOUND HAND AND/OR FINGERS OPEN LACERATED WITHOUT FRACTURES MODERATE - NO TENDON INVOLVEMENT OR LIMITED TO SUBLIMIS TE INVOLVEMENT
059 WOUND HAND OPEN LACERATED CONTUSED CRUSHED WITH FRACTURE(S) ALL CASES - INVOLVING FRACTURES OF CARPALS AND/OR METAC/
060 WOUND FINGERS OPEN LACERATED CONTUSED CRUSHED WITH FRACTURE(S) OF PHALANGEALS REQUIRING REHABILITATION
061 CRUSH INJURY UPPER EXTREMITY SEVERE - LIMB NOT SALVAGEABLE
062 CRUSH INJURY UPPER EXTREMITY MODERATE - LIMB SALVAGEABLE
063 [redacted]
064 DISLOCATION SHOULDER CLOSED ALL CASES
065 DISLOCATION/FRACTURE ELBOW CLOSED ACUTE ALL CASES
066 [redacted]
067 DISLOCATION HAND OR WRIST CLOSED ACUTE
068 DISLOCATION FINGERS CLOSED ACUTE
069 AMPUTATION HAND TRAUMATIC COMPLETE ALL CASES
070 AMPUTATION FOREARM TRAUMATIC COMPLETE ALL CASES
071 AMPUTATION FULL ARM TRAUMATIC COMPLETE ALL CASES
072 SPRAIN WRIST CLOSED ACUTE ALL CASES
073 SPRAIN THUMB CLOSED ACUTE SEVERE
074 SPRAIN FINGERS CLOSED ACUTE MODERATE - NO THUMB INVOLVEMENT
075 BURN THERMAL SUPERFICIAL UPPER EXTREMITIES GREATER THAN 10% BUT LESS THAN 20% OF TOTAL BODY AREA INVOLVED
076 BURN THERMAL SUPERFICIAL UPPER EXTREMITY LESS THAN 10% OF TOTAL BODY AREA INVOLVED
077 BURN THERMAL PARTIAL THICKNESS UPPER EXTREMITIES GREATER THAN 10% BUT LESS THAN 20% OF TOTAL BODY AREA INVOLVED
078 BURN THERMAL PARTIAL THICKNESS UPPER EXTREMITY LESS THAN 10% OF TOTAL BODY AREA INVOLVED
079 BURN THERMAL FULL THICKNESS UPPER EXTREMITIES GREATER THAN 10% BUT LESS THAN 20% OF TOTAL BODY AREA INVOLVED
080 BURN THERMAL FULL THICKNESS UPPER EXTREMITY LESS THAN 10% OF TOTAL BODY AREA INVOLVED
081 FRACTURE RIBS CLOSED SEVERE - MULTIPLE FRACTURES
082 FRACTURE RIB(S) CLOSED MODERATE
083 INJURY LUNG CLOSED (BLAST CRUSH) WITH PNEUMOHEMOTHORAX SEVERE - ONE LUNG WITH PULMONARY CONTUSION AND ACUTE SEVERE RESPIRATORY DISTRESS
084 INJURY LUNG CLOSED (BLAST CRUSH) WITH PNEUMOHEMOTHORAX MODERATE - ONE LUNG WITH PULMONARY CONTUSION AND RESPIRATORY DISTRESS
085 WOUND THORAX (ANTERIOR OR POSTERIOR) OPEN SUPERFICIAL LACERATED CONTUSED ABRADED AVULSED REQUIRING MAJOR DEBRIDEME
086 WOUND THORAX (ANTERIOR OR POSTERIOR) OPEN SUPERFICIAL LACERATED CONTUSED ABRADED AVULSED NOT REQUIRING MAJOR DEBRIC
087 WOUND THORAX (ANTERIOR OR POSTERIOR) OPEN PENETRATING WITH ASSOCIATED RIB FRACTURES AND PNEUMOHEMOTHORAX ACUTE SEVE RESPIRATORY DISTRESS
088 WOUND THORAX (ANTERIOR OR POSTERIOR) OPEN PENETRATING WITH ASSOCIATED RIB FRACTURES AND PNEUMOHEMOTHORAX MODERATE RESPIRATORY DISTRESS
089 [redacted]
090 BURN THERMAL SUPERFICIAL TRUNK GREATER THAN 20% BUT LESS THAN 30% OF TOTAL BODY AREA INVOLVED
091 BURN THERMAL SUPERFICIAL TRUNK GREATER THAN 10% BUT LESS THAN 20% OF TOTAL BODY AREA INVOLVED
092 BURN THERMAL PARTIAL THICKNESS TRUNK GREATER THAN 20% BUT LESS THAN 30% OF TOTAL BODY AREA INVOLVED
093 BURN THERMAL PARTIAL THICKNESS TRUNK GREATER THAN 10% BUT LESS THAN 20% OF TOTAL BODY AREA INVOLVED
094 BURN THERMAL FULL THICKNESS TRUNK GREATER THAN 20% BUT LESS THAN 30% OF TOTAL BODY AREA INVOLVED
095 BURN THERMAL FULL THICKNESS TRUNK GREATER THAN 10% BUT LESS THAN 20% OF TOTAL BODY AREA INVOLVED
096 WOUND ABDOMINAL WALL (ANTERIOR OR POSTERIOR) LACERATED ABRADED CONTUSED AVULSED WITHOUT ENTERING ABDOMINAL CAVITY SEVERE - REQUIRING MAJOR DEBRIDEMENT
097 WOUND ABDOMINAL WALL (ANTERIOR OR POSTERIOR) LACERATED ABRADED CONTUSED AVULSED WITHOUT ENTERING ABDOMINAL CAVITY REQUIRING MAJOR DEBRIDEMENT
098 WOUND LIVER CLOSED ACUTE (CRUSH FRACTURE) MAJOR LIVER DAMAGE
099 WOUND LIVER CLOSED ACUTE (CRUSH FRACTURE) MINOR LIVER DAMAGE
100 WOUND SPLEEN CLOSED ACUTE (CRUSH FRACTURE) ALL CASES
101 WOUND ABDOMINAL CAVITY OPEN WITH LACERATING PENETRATING PERFORATING WOUND TO THE LARGE BOWEL
102 WOUND ABDOMINAL CAVITY OPEN WITH LACERATING PENETRATING PERFORATING WOUND TO SMALL BOWEL WITHOUT MAJOR OR MULTIPLI RESECTIONS
103 WOUND ABDOMINAL CAVITY OPEN WITH PENETRATING PERFORATING WOUND OF LIVER MAJOR DAMAGE
104 WOUND ABDOMINAL CAVITY OPEN WITH PENETRATING PERFORATING ABDOMINAL WOUND WITH LACERATED LIVER
105 WOUND ABDOMINAL CAVITY OPEN WITH PENETRATING PERFORATING WOUND OF SPLEEN
106 WOUND ABDOMINAL CAVITY OPEN WITH LACERATED PENETRATED PREFORATED WOUND WITH SHATTERED KIDNEY
107 WOUND ABDOMINAL CAVITY OPEN WITH LACERATED PENETRATING PERFORATING WOUND WITH LACERATED KIDNEY INITIALLY REPAIRED B SUBSEQUENT NEPHRECTOMY
108 WOUND ABDOMINAL CAVITY OPEN WITH LACERATED PENETRATING PERFORATING WOUND WITH SHATTERED BLADDER
109 WOUND ABDOMINAL CAVITY OPEN WITH LACERATED PENETRATING PERFORATING WOUND WITH LACERATED BLADDER
110 WOUND BUTTOCKS SEVERE - OPEN LACERATED PENETRATING PERFORATING AND AVULSED
111 WOUND BUTTOCKS MODERATE - OPEN LACERATED CONTUSED AND ABRADED
112 DISPLACED FRACTURE OF PELVIS CLOSED WITH ASSOCIATED SOFT TISSUE DAMAGE AND PELVIC ORGAN DAMAGE
113 NON-DISPLACED FRACTURE OF PELVIS CLOSED WITH ASSOCIATED SOFT TISSUE DAMAGE
114 WOUND ABDOMEN OPEN WITH PELVIC FRACTURE AND PENETRATING PERFORATING WOUNDS TO MULTIPLE PELVIC STRUCTURES (MALE OR FE
115 WOUND ABDOMEN OPEN WITH PELVIC FRACTURE AND PENETRATING PERFORATING WOUNDS TO PELVIC COLON ONLY (MALE OR FEMALE)
116 WOUND EXTERNAL GENITALIA MALE SEVERE - LACERATED AVULSED CRUSHED
117 WOUND EXTERNAL GENITALIA MALE MODERATE - ABRADED AND CONTUSED
118 WOUND EXTERNAL GENITALIA FEMALE SEVERE - LACERATED AVULSED CRUSHED

119 WOUND EXTERNAL GENITALIA FEMALE MODERATE - ABRADED CONTUSED
120 FRACTURE CLOSED FEMUR SHAFT ALL CASES
121 WOUND THIGH OPEN WITHOUT FRACTURE NERVE OR VASCULAR INJURY REQUIRING MAJOR DEBRIDEMENT
122 WOUND THIGH OPEN WITHOUT FRACTURE NERVE OR VASCULAR INJURY NOT REQUIRING MAJOR DEBRIDEMENT
123 WOUND THIGH OPEN LACERATED PENETRATING PERFORATING WITH FRACTURE AND NERVE/VASCULAR INJURY LIMB NOT SALVAGEABLE
124 WOUND THIGH OPEN LACERATED PENETRATING PERFORATING WITH FRACTURE AND NERVE AND/OR VASCULAR INJURY LIMB SALVAGEABLE
125 WOUND KNEE OPEN LACERATED PENETRATING PERFORATING WITH JOINT SPACE PENETRATION SHATTERED KNEE
126 WOUND KNEE OPEN LACERATED PENETRATING PERFORATING WITH JOINT SPACE PENETRATION ARTICULAR CARTILAGE DAMAGE NO BONE I
127 FRACTURE CLOSED TIBIA AND FIBULA SHAFT ALL CASES
128 WOUND LOWER LEG OPEN LACERATED PENETRATING PERFORATING WITHOUT FRACTURES REQUIRING MAJOR DEBRIDEMENT
129 WOUND LOWER LEG OPEN LACERATED PENETRATING PERFORATING WITHOUT FRACTURES NOT REQUIRING MAJOR DEBRIDEMENT
130 WOUND LOWER LEG OPEN LACERATED PENETRATING PERFORATING WITH FRACTURE AND NERVE/VASCULAR INJURY LIMB NOT SALVAGEABI
131 WOUND LOWER LEG OPEN LACERATED PENETRATING PERFORATING WITH FRACTURE AND NERVE AND/OR VASCULAR INJURY LIMB SALVAGE
132 FRACTURE ANKLE/FOOT CLOSED DISPLACED REQUIRING REDUCTION
133 FRACTURE ANKLE/FOOT CLOSED NONDISPLACED NOT REQUIRING REDUCTION
134 WOUND ANKLE FOOT TOES OPEN LACERATED CONTUSED WITHOUT FRACTURES BUT REQUIRING MAJOR DEBRIDEMENT
135 WOUND ANKLE FOOT TOES OPEN LACERATED CONTUSED WITHOUT FRACTURES NOT REQUIRING MAJOR DEBRIDEMENT
136 WOUND ANKLE FOOT TOES OPEN PENETRATING PERFORATING WITH FRACTURES AND NERVE/VASCULAR INJURY LIMB NOT SALVAGEABLE
137 WOUND ANKLE FOOT TOES OPEN PENETRATING PERFORATING WITH FRACTURES AND NERVE AND/OR VASCULAR INJURY LIMB SALVAGEABL
138 CRUSH INJURY LOWER EXTREMITY LIMB NOT SALVAGEABLE
139 CRUSH INJURY LOWER EXTREMITY LIMB SALVAGEABLE
140 DISLOCATION HIP CLOSED ACUTE ALL CASES
141 TEAR LIGAMENTS KNEE ACUTE COMPLETE RUPTURE
142 TEAR LIGAMENTS KNEE ACUTE INCOMPLETE RUPTURE
143 DISLOCATION TOES CLOSED ACUTE ALL CASES
144 AMPUTATION FOOT TRAUMATIC COMPLETE ALL CASES
145 AMPUTATION BELOW KNEE TRAUMATIC COMPLETE ALL CASES
146 AMPUTATION TRAUMATIC COMPLETE REQUIRING HIP DISARTICULATION
147 AMPUTATION ABOVE KNEE TRAUMATIC COMPLETE
148 SPRAIN ANKLE CLOSED ACUTE WITH COMPLETE LIGAMENT RUPTURE
149 SPRAIN ANKLE CLOSED ACUTE GRADE 2 INCOMPLETE LIGAMENT RUPTURE
150 BURN THERMAL SUPERFICIAL LOWER EXTREMITIES AND GENITALIA GREATER THAN 30% BUT LESS THAN 40% OF TOTAL BODY AREA INVOLVED
151 BURN THERMAL SUPERFICIAL LOWER EXTREMITY AND GENITALIA GREATER THAN 15% BUT LESS THAN 30% OF TOTAL BODY AREA INVOLVED
152 BURN THERMAL PARTIAL THICKNESS LOWER EXTREMITIES AND GENITALIA GREATER THAN 30% BUT LESS THAN 40% OF TOTAL BODY AREA IN
153 BURN THERMAL PARTIAL THICKNESS LOWER EXTREMITY AND GENITALIA GREATER THAN 15% BUT LESS THAN 30% OF TOTAL BODY AREA INV
154 BURN THERMAL FULL THICKNESS LOWER EXTREMITIES AND GENITALIA GREATER THAN 30% BUT LESS THAN 40% OF TOTAL BODY AREA INVOL
155 BURN THERMAL FULL THICKNESS LOWER EXTREMITY AND GENITALIA GREATER THAN 15% BUT LESS THAN 30% OF TOTAL BODY AREA INVOLV
156 BLISTERS HAND FINGERS FOOT TOES DUE TO FRICTION ACUTE MODERATE - ALL CASES
157 INSECT BITES AND STINGS (UNSPECIFIED BODY AREA) WITH SYSTEMIC SYMPTOMS AND/OR RESPIRATORY DIFFICULTY
158 BITES AND STINGS (UNSPECIFIED BODY AREA) MODERATE - LOCALIZED SYMPTOMS
159 MIW BRAIN AND CHEST WITH SUCKING CHEST WOUND AND PNEUMOHEMOTHORAX
160 MIW BRAIN AND ABDOMEN WITH PENETRATING PERFORATING WOUND COLON
161 MIW BRAIN AND ABDOMEN WITH PENETRATING PERFORATING WOUND KIDNEY
162 MIW BRAIN AND ABDOMEN WITH PENETRATING PERFORATING WOUND BLADDER
163 MIW BRAIN AND ABDOMEN WITH SHOCK AND PENETRATING PERFORATING WOUND SPLEEN
164 MIW BRAIN AND ABDOMEN WITH SHOCK AND PENETRATING PERFORATING WOUND LIVER
165 MIW BRAIN AND LOWER LIMBS REQUIRING BILATERAL ABOVE KNEE AMPUTATIONS
166 MIW CHEST WITH PNEUMOHEMOTHORAX AND ABDOMEN WITH PENETRATING WOUND COLON
167 MIW CHEST WITH PNEUMOHEMOTHORAX AND ABDOMEN WITH PENETRATING PERFORATING WOUND KIDNEY
168 MIW CHEST WITH PNEUMOHEMOTHORAX AND ABDOMEN WITH PERFORATING WOUND BLADDER
169 MIW CHEST WITH PNEUMOHEMOTHORAX AND ABDOMEN WITH PENETRATING PERFORATING WOUND SPLEEN
170 MIW CHEST WITH PNEUMOHEMOTHORAX AND ABDOMEN WITH PENETRATING PERFORATING WOUND LIVER
171 MIW CHEST WITH PNEUMOHEMOTHORAX AND LIMBS WITH FRACTURE AND VASCULAR INJURY
172 MIW ABDOMEN WITH PENETRATING PERFORATING WOUND OF COLON AND BLADDER
173 MIW ABDOMEN WITH PENETRATING PERFORATING WOUND OF COLON AND SPLEEN
174 MIW ABDOMEN WITH PENETRATING PERFORATING WOUND OF COLON AND LIVER
175 MIW ABDOMEN AND LIMBS WITH PENETRATING PERFORATING WOUND OF COLON AND OPEN FRACTURE AND NEUROVASCULAR INJURY OF SALVAGEABLE LOWER LIMB
176 MIW ABDOMEN AND PELVIS WITH PENETRATING PERFORATING WOUND OF LIVER AND KIDNEY
177 MIW ABDOMEN AND PELVIS WITH PENETRATING PERFORATING WOUNDS OF SPLEEN AND BLADDER
178 MIW ABDOMEN PELVIS LIMBS WITH FRACTURE AND NEUROVASCULAR INJURY LIMB SALVAGEABLE AND PENETRATING WOUND KIDNEY
179 MIW ABDOMEN PELVIS LIMBS WITHOUT FRACTURE OR NEUROVASCULAR INJURY AND PENETRATING PERFORATING WOUND BLADDER
180 MIW ABDOMEN AND LOWER LIMBS WITH FRACTURE AND NERVE INJURY WITH PENETRATING WOUND OF SPLEEN WITH FULL THICKNESS BURNS GREATER THAN 20% OF TBSA
181 MIW ABDOMEN AND LIMBS WITHOUT FRACTURE OR NERVE INJURY WITH PENETRATING WOUND OF LIVER
182 MIW CHEST WITH PNEUMOHEMOTHORAX SOFT TISSUE INJURY TO UPPER LIMBS AND PENETRATING WOUND OF BRAIN
183 MIW CHEST WITH PNEUMOHEMOTHORAX SOFT TISSUE INJURY TO UPPER LIMBS AND ABDOMEN WITH WOUND OF COLON
184 MIW CHEST WITH PNEUMOHEMOTHORAX PELVIS AND ABDOMEN WITH WOUND OF COLON AND BLADDER
185 MIW ABDOMEN AND CHEST WITH MULTIPLE ORGAN DAMAGE
186 MULTIPLE NONPERFORATING FRAGMENT WOUNDS OF SKIN AND SOFT TISSUE
187 TRENCH FOOT IMMERSION FOOT SEVERE - VESICLE FORMATION
188 TRENCH FOOT IMMERSION FOOT MODERATE - NO VESICLE FORMATION
189 [redacted]

190 FROSTBITE FULL SKIN THICKNESS OR DEEPER INVOLVEMENT
191 FROSTBITE LESS THAN FULL SKIN THICKNESS
192 HYPOTHERMIA ALL CASES
193 HEAT STROKE
194 HEAT EXHAUSTION
195 HEAT CRAMPS ALL CASES
196 APPENDICITIS ACUTE WITH PERFORATION RUPTURE PERITONITIS
197 APPENDICITIS ACUTE WITHOUT PERFORATION RUPTURE PERITONITIS
198 INGUINAL HERNIA COMPLICATED DIRECT OR INDIRECT SLIDING INCARCERATION OF BOWEL
199 INGUINAL HERNIA UNCOMPLICATED DIRECT OR INDIRECT NO SLIDING NO INCARCERATION OF BOWEL OR BLADDER
200 INTERNAL DERANGEMENT OF KNEE CHRONIC WITH TORN MENISCUS AND/OR LIGAMENT LAXITY
201 STRAIN LUMBOSACRAL SACROILIAC JOINT CHRONIC ALL CASES
202 ECZEMA DERMATITIS SEBORRHEIC CONTACT OTHERS AFFECTING WEIGHT BEARING OR PRESSURE AREAS
203 ECZEMA DERMATITIS SEBORRHEIC CONTACT OTHERS NOT AFFECTING WEIGHT BEARING AREAS
204 BOILS FURUNCLES PYODERMA REQUIRING SURGERY
205 BOILS FURUNCLES PYODERMA ALL OTHER CASES
206 CELLULITIS INVOLVING FACE OR WEIGHT BEARING AREAS
207 CELLULITIS OTHER THAN FACE OR WEIGHT BEARING AREAS
208 DERMATOPHYTOSIS SEVERE - AFFECTING FEET
209 DERMATOPHYTOSIS ALL OTHER CASES
210 PEDICULOSIS ALL CASES
211 SCABIES ALL CASES
212 PILONIDAL CYST/ABSCESS REQUIRING MAJOR EXCISION
213 PILONIDAL CYST/ABSCESS REQUIRING MINOR INCISION
214 INGROWN TOENAILS BILATERAL WITH SECONDARY INFECTIONS UNRESOLVABLE AT ECHELON 2
215 INGROWN TOENAILS WITHOUT SECONDARY INFECTION
216 HERPES SIMPLEX AND ZOSTER WITHOUT ENCEPHALITIS ALL TYPES ALL CASES
217 [redacted]
218
219 HYPERHIDROSIS ALL CASES
220 BLEPHARITIS ALL CASES
221 CONJUNCTIVITIS SEVERE - ALL CASES
222 CONJUNCTIVITIS MODERATE - ALL CASES
223 CORNEAL ULCER
224 CORNEAL ABRASION
225 IRIDOCYCLITIS ACUTE MARKED VISUAL IMPAIRMENT
226 IRIDOCYCLITIS ACUTE MINIMAL VISUAL IMPAIRMENT
227 REFRACTION AND ACCOMMODATION DISORDERS REFRACTION REQUIRED
228 REFRACTION AND ACCOMMODATION DISORDERS REPLACEMENT OF SPECTACLES REQUIRED
229 OTITIS EXTERNA ALL CASES
230 OTITIS MEDIA ACUTE SUPPURATIVE ALL CASES
231 [redacted]
232 ALLERGIC RHINITIS ALL CASES
233 UPPER RESPIRATORY INFECTIONS ACUTE ALL CASES
234 BRONCHITIS ACUTE ALL CASES
235 ASTHMA WITH DISABLING SYMPTOMS OR REPEATED ATTACKS
236 ASTHMA OTHER CASES
237 [redacted]
238
239 ACUTE RESPIRATORY DISEASE SEVERE
240 ACUTE RESPIRATORY DISEASE MODERATE
241 [redacted]
242
243 FOOD POISONING ALL ORGANISMS DISABLING SYMPTOMS
244 FOOD POISONING ALL ORGANISMS MODERATE SYMPTOMS
245 DIARRHEAL DISEASE SEVERE
246 DIARRHEAL DISEASE MODERATE
247 UPPER GASTROINTESTINAL HEMORRHAGE, GASTRITIS OR ULCER
248 GASTRITIS ACUTE ALL CASES
249 PEPTIC ULCER GASTRIC OR DUODENAL PENETRATING AND/OR PERFORATING
250 PEPTIC ULCER GASTRIC OR DUODENAL UNCOMPLICATED
251 REGIONAL ILEITIS DISABLING SYMPTOMS UNRESPONSIVE TO TREATMENT
252 REGIONAL ILEITIS RESPONDS TO TREATMENT
253 HELMINTHIASIS ALL CASES
254 [redacted]
255
256 HEMORRHOIDAL DISEASE ALL CASES
257 [redacted]
258 SEVERE HYPERTENSION
259 ISCHEMIC HEART DISEASE
260 PHLEBITIS DEEP VEIN INVOLVEMENT
261 [redacted]
262 TENOSYNOVITIS ELBOW WRIST SHOULDERS ETC.

263 MENINGO-ENCEPHALITIS UNCOMPLICATED
264 MENINGO-ENCEPHALITIS COMPLICATED
265 NEAR DROWNING WITHOUT CERVICAL SPINE INJURY OR HYPOTHERMIA ALL CASES
266 TOXIC INHALATION INCLUDING BURN-RELATED RESPIRATORY INJURIES SEVERE - ALL CASES
267 [redacted]
268 WHITE PHOSPHORUS BURNS RESULTANT PARTIAL THICKNESS BURNS < 40% TBSA ALL CASES
269 SEXUALLY TRANSMITTED DISEASES (STD) URETHRITIS
270 SEXUALLY TRANSMITTED DISEASES (STD) GENITAL ULCERS AND/OR ADENOPATHY
271 SEXUALLY TRANSMITTED DISEASES (STD) COMPLICATED
272 GLOMERULONEPHRITIS ACUTE
273 GLOMERULONEPHRITIS CHRONIC
274 PYELONEPHRITIS ACUTE SECONDARY TO OBSTRUCTION
275 PYELONEPHRITIS ACUTE NO OBSTRUCTION
276 NEPHROTIC SYNDROME ALL CASES
277 URETERAL CALCULUS CAUSING OBSTRUCTION IMPACTED
278 URETERAL CALCULUS NOT CAUSING OBSTRUCTION
279 EPIDIDYMITIS CYSTITIS PROSTATITIS ACUTE ALL CASES
280 BALANOPOSTHITIS ALL CASES
281 [redacted]
282 INFECTIOUS MONONUCLEOSIS ALL CASES
283 HEPATITIS INFECTIOUS VIRAL ALL CASES
284 [redacted]
285 CHOLECYSTITIS ACUTE WITH STONES ALL CASES
286 PANCREATITIS ACUTE ALL CASES
287 CIRRHOSIS ALL CASES
288 [redacted]
289 NEOPLASMS MALIGNANT
290 NEOPLASMS BENIGN
291 ABNORMAL UTERINE BLEEDING
292 DYSMENORRHEA AMENORRHEA
293 PELVIC INFLAMMATORY DISEASE (PID) ALL CASES
294 CERVICITIS ENDOCERVICITIS WITH SYMPTOMATIC LEUKORRHEA
295 VULVOVAGINITIS
296 [redacted]
297 TUBAL PREGNANCY ALL CASES
298 [redacted]
299 ABORTION SPONTANEOUS WITH HEMORRHAGE
300 [redacted]
301 PSYCHOSIS
302 CONDUCT DISORDERS
303 NON-PSYCHOTIC MENTAL DISORDERS
304 STRESS REACTION SEVERE UNSTABLE SLOW IMPROVEMENT
305 STRESS REACTION SEVERE STABLE SLOW IMPROVEMENT
306 ALCOHOL DEPENDENCY SYNDROME MODERATE
307 ALCOHOL MISUSE SIMPLE INTOXICATION
308 DRUG DEPENDENCY (OTHER THAN ALCOHOL) SEVERE
309 DRUG MISUSE (OTHER THAN ALCOHOL) MILD OR MODERATE
310 STRESS REACTION MILD/MODERATE
311 EYE WOUND LACERATED PENETRATED WITH RETINAL INJURY EYE SALVAGEABLE
312 WOUND KNEE OPEN LACERATED PENETRATING PERFORATING WITH JOINT SPACE PENETRATION NO BONE OR ARTICULAR CARTILAGE INJURY
313 WOUND ABDOMINAL CAVITY OPEN WITH LACERATED PENETRATING PERFORATING WOUND KIDNEY MODERATE - KIDNEY SALVAGEA
314 STRESS REACTION SEVERE UNSTABLE DELAYED IMPROVEMENT
315 STRESS REACTION SEVERE UNSTABLE PERSISTING
316 ALCOHOL DEPENDENCY SEVERE - IMPENDING OR ACTUAL DTS
317 DRUG MISUSE (OTHER THAN ALCOHOL) SEVERE - ATYPICAL NO DEPENDENCY
318 STRESS REACTION SEVERE - RAPID IMPROVEMENT
319 WOUND FINGERS OPEN LACERATED CONTUSED CRUSHED WITH FRACTURE(S) OF PHALANGEALS NOT REQUIRING REHABILITATION
320 [redacted]
321 [redacted]
322 FRACTURE MANDIBLE WITH/WITHOUT ORAL LACERATION WITHOUT AIRWAY INVOLVEMENT UNSTABLE SEVERE REQUIRING OPEN REDUCTION
323 FRACTURE MANDIBLE WITH/WITHOUT ORAL LACERATION WITHOUT AIRWAY INVOLVEMENT MILD DISPLACEMENT STABLE
324 STRESS REACTION SEVERE STABLE - DELAYED IMPROVEMENT
325 STRESS REACTION SEVERE STABLE PERSISTING
326 [redacted]
327 [redacted]
328 ANIMAL BITES AND RABIES EXPOSURE
329 TRACHOMA ALL CASES
330 SCHISTOSOMIASIS ALL CASES
331 MALARIA SEVERE - ALL SPECIES
332 MALARIA MODERATE - ALL SPECIES
333 FEBRILE ILLNESS ACUTE SEVERE - EXCEPT MALARIA AND PNEUMONIA
334 FEBRILE ILLNESS ACUTE MODERATE

335 SNAKE BITE
336 [redacted]
337
338
339 CUTANEOUS ULCERS INCLUDING LEISHMANIASIS
340 [redacted]
341
342
343
344
345
346 EYE WOUND DIRECTED ENERGY INDUCED (LASER) SEVERE OF MACULA AND/OR OPTIC NERVE, WITH VITREOUS BLOOD, SEVERE VISUAL LOSE, O BOTH EYES.
347 EYE WOUND DIRECTED ENERGY INDUCED (LASER/RFR) MODERATE TO SEVERE, POSTERIOR, NONMACULAR, NONOPTIC NERVE, VISUAL LOSS SECONDARY TO VITREOUS BLOOD.
348 EYE WOUND DIRECTED ENERGY INDUCED (LASER) MODERATE NONMACULAR, NONOPTIC NERVE, NO VITREOUS BLOOD.
349 EYE WOUND DIRECTED ENERGY INDUCED (LASER/RFR) MILD TO MODERATE, ANTERIOR, PAIN WITH PHOTOPHOBIA AND DISRUPTION OF CORNEAI INTEGRITY.
350 EYE WOUND DIRECTED ENERGY INDUCED (LASER) MILD, FLASH BLINDNESS, NO PERMANENT DAMAGE.
351 ANTHRAX, INHALATION, NON-VACCINATED, INCUBATING, ASYMPTOMATIC
352 ANTHRAX, INHALATION, NON-VACCINATED, PRODROMAL
353 ANTHRAX, INHALATION, NON-VACCINATED, ACUTE
354 ANTHRAX, INHALATION, VACCINATED, ASYMPTOMATIC
355 ANTHRAX, INHALATION, VACCINATED, PRODROMAL
356 ANTHRAX, INHALATION, VACCINATED, ACUTE
357 PLAGUE, INHALATION, INCUBATING, ASYMPTOMATIC
358 PLAGUE, INHALATION, ACUTE
359 PLAGUE, MENINGITIS
360 BOTULISM WITH RESPIRATORY FAILURE
361 BOTULISM WITHOUT RESPIRATORY FAILURE
362 STAPHYLOCOCCAL ENTEROTOXIN B WITH RESPIRATORY FAILURE
363 STAPHYLOCOCCAL ENTEROTOXIN B WITHOUT RESPIRATORY FAILURE
364 VENEZUELAN EQUINE ENCEPHALITIS WITH CENTRAL NERVOUS SYSTEM INVOLVEMENT
365 SMALLPOX, INCUBATING, ASYMPTOMATIC
366 SMALLPOX, SYMPTOMATIC
367 TULAREMIA, INHALATION, INCUBATING ASYMPTOMATIC
368 TULAREMIA, INHALATION, ACUTE
369 RICIN, INHALATION
370 Q FEVER, INHALATION, INCUBATING, ASYMPTOMATIC
371 Q FEVER, INHALATION, ACUTE
372 BOTULISM EXPOSURE WITHOUT SYMPTOMS
373. [redacted]
374.
375.
376.
377.
378.
379.
380.
381.
382. NERVE AGENT VAPOR ONLY (INHALATION) MILD
383. NERVE AGENT VAPOR MODERATE
384. NERVE AGENT VAPOR SEVERE
385. NERVE AGENT LIQUID MILD
386. NERVE AGENT LIQUID MODERATE
387. NERVE AGENT LIQUID MODERATELY SEVERE
388. NERVE AGENT LIQUID SEVERE
389. WOUND, LOWER LEG, OPEN, LACERATED, PENETRATING, WITHOUT FRACTURES, REQUIRING MAJOR DEBRIDEMENT, MODERATELY CONTAMINATEI LIQUID NERVE AGENT
390. NERVE AGENT COMBINED PENETRATING ABDOMINAL WOUND
391. MUSTARD LIQUID/VAPOR MILD
392. MUSTARD LIQUID/VAPOR MODERATE
393. MUSTARD LIQUID/VAPOR SEVERE
394. HD/LEWISITE COMBINATION, MILD
395. PHOSGENE OXIME
396. CYANIDE (AC) INHALATION, MILD
397. CYANIDE (AC) INHALATION, SEVERE
398. PULMONARY AGENT WITH EARLY (<4HOURS) SYMPTOMS
399. PULMONARY AGENT WITH DELAYED (>4 HOURS) SYMPTOMS
400. ANTICHOLINERGIC INCAPACITATING AGENT
401. WHITE PHOSPHORUS INJURY, SKIN EXPOSURE

APPENDIX I. SAMPLE TREATMENT BRIEF

29. Fracture, spine, open, with cord damage, cervical spine with respiratory distress.

LENGTH OF STAY MATRIX:

	3
ICU	1
ICW	0
MCW	0
Total	1

BLOOD USAGE MATRIX:

	Blood	Cl H
ECHELON 3	0	II

ECHELON 1A

Assumptions: Litter patient; respiratory distress; moderate hemorrhage; VS: stable; flaccid extremities; 50% die at Echelon 1.

Treatment: Dress wound; stabilize head, neck, and spine with cervical collar; Nasopharngeal airway, IV started 100%; urgent transport.

ECHELON 1B

Assumptions: Litter patient; respiratory distress; moderate hemorrhage; VS: stable; flaccid extremities; 50% die at Echelon 1.

Treatment: Start 2nd IV in 100%, Ventilation assistance with ET tube/cricothyroidotomy in 100% and administer O_2; Foley catheter, NG tube; pain meds; transport with C-collar and on spine board.

ECHELON 2

Assumptions: Litter patient; 100% artificial airway, moderate hemorrhage; VS: stable; flaccid extremities.25% die at this level.

Treatment: Ventilator/manual ventilation, airway maintenance, maintain IVs, IV antibiotics, Maintain NG / foley tube, Comfort meds; C-spine Series, C-spine immobilization, Gross debridement, irrigation, and hemorrhage control, Urgent transport.

ECHELON 3

Assumptions: Litter patient; assisted ventilation from Echelon 2; Class II hemorrhage; flaccid paralysis all extremities; VS: stable.

Treatment: EMT: VS; stabilize C-spine; restart one IV in 20%, 2 liters RL; IV antibiotics; parenteral pain meds; tetanus toxoid; ventilator with O_2; maintain Foley catheter/ NG tube; cardiac monitor and pulse oximetry and capnography; dressing to wound; orthopedist and neurosurgeon consults; x-rays: 25% CT scan with myelogram (those with incomplete cord injury);chest, thoracic, cervical; lab: Hct., TC x 2 units.

OR: neck exploration/irrigation/debridement under general anesthesia; halo vest application 50%; posterior element stabilization with wires; arterial line; pressor agents; 2 liters RL;x-ray: C-spine OR table time - 180 min.

WARDS: ICU - VS; IVs with IV antibiotics; parenteral pain and neurologic meds; gastroenterologic meds; low molecular heparin; pressors; 5% CVP line; ventilator with O_2; cardiac monitor and pulse oximetry; Foley catheter; NG tube, halo care; dressing reinforcement; lab: Hct. Urgent transport.

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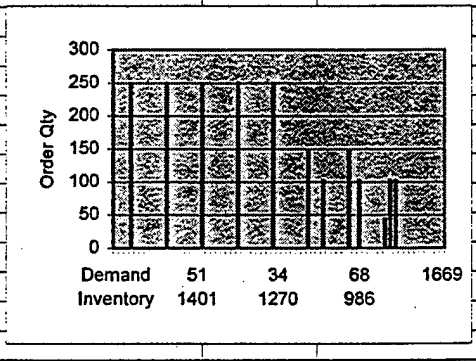
APPENDIX J. VITAL SIGN MONITOR

			Safety level 255		Start Cost	11295792
					Unit Cost	$6,768
Day	Inventory	Demand	Order qty	Receive	Throughput	
0	1669					
1	1618	51	0	0.00		
2	1567	51	250	0.00		
3	1515	51	0	0.00	0.00	
4	1464	51	0	0.00	0.00	
5	1413	51	0	0.00	0.00	
6	1362	51	0	0.00	0.00	
7	1311	51	0	0.00	250.00	
8	1509	51	0	250.00	250.00	
9	1458	51	250	0.00	250.00	
10	1407	51	0	0.00	250.00	
11	1356	51	0	0.00	250.00	
12	1305	51	0	0.00	250.00	
13	1253	51	0	0.00	250.00	
14	1202	51	0	0.00	250.00	
15	1401	51	0	250.00	250.00	
16	1350	51	250	0.00	250.00	
17	1299	51	0	0.00	250.00	
18	1247	51	0	0.00	250.00	
19	1196	51	0	0.00	250.00	
20	1145	51	0	0.00	250.00	
21	1111	34	0	0.00	250.00	
22	1327	34	0	250.00	250.00	
23	1293	34	250	0.00	250.00	
24	1259	34	0	0.00	250.00	
25	1225	34	0	0.00	250.00	
26	1190	34	0	0.00	250.00	
27	1156	34	0	0.00	250.00	
28	1122	34	0	0.00	250.00	
29	1338	34	0	250.00	250.00	
30	1304	34	250	0.00	250.00	
31	1270	34	0	0.00	250.00	
32	1236	34	0	0.00	250.00	
33	1202	34	0	0.00	250.00	
34	1168	34	0	0.00	250.00	
35	1134	34	0	0.00	250.00	
36	1349	34	0	250.00	250.00	
37	1315	34	147	0.00	147.40	
38	1281	34	0	0.00	147.40	
39	1247	34	0	0.00	147.40	
40	1213	34	103	0.00	250.00	
41	1145	68	0	0.00	250.00	
42	1077	68	0	0.00	250.00	
43	1156	68	0	147.40	250.00	
44	1088	68	0	0.00	102.60	
45	1019	68	147	0.00	250.00	

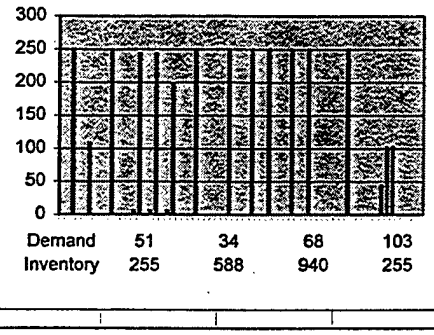
46	1054	68	0	102.60	250.00
47	986	68	103	0.00	250.00
48	917	68	0	0.00	250.00
49	849	68	0	0.00	250.00
50	781	68	0	0.00	250.00
51	826	103	0	147.40	250.00
52	723	103	45	0.00	147.40
53	723	103	103	102.60	250.00
54	621	103	103	0.00	250.00
55	518	103	0	0.00	250.00
56	415	103	0	0.00	250.00
57	313	103	0	0.00	250.00
58	255	103	0	44.80	250.00
59	255	103	0	102.60	205.20
60	255	103	0	102.60	102.60
Total Inv	67092				
Weight	1				
Obj	1669				



APPENDIX K. VITAL SIGNS MONITOR 3 DAY LEAD TIME

			Safety Level 255		Start Cost	$2,418,883
					Unit Cost	$6,768
Day	Inventory	Demand	Order qty	Receive	Throughput	
0	357					
1	306	51	250	0.00		
2	255	51	0	0.00		
3	454	51	0	250.00	250.00	
4	403	51	108	0.00	108.40	
5	351	51	0	0.00	108.40	
6	409	51	0	108.40	108.40	
7	357	51	0	0.00	0.00	
8	306	51	250	0.00	250.00	
9	255	51	0	0.00	250.00	
10	454	51	0	250.00	250.00	
11	403	51	0	0.00	0.00	
12	351	51	6	0.00	6.00	
13	300	51	244	0.00	250.00	
14	255	51	0	6.00	250.00	
15	448	51	6	244.00	250.00	
16	397	51	244	0.00	250.00	
17	351	51	0	6.00	250.00	
18	544	51	6	244.00	250.00	
19	493	51	197	0.00	203.20	
20	448	51	0	6.00	203.20	
21	611	34	0	197.20	197.20	
22	577	34	0	0.00	0.00	
23	543	34	250	0.00	250.00	
24	509	34	0	0.00	250.00	
25	725	34	0	250.00	250.00	
26	690	34	0	0.00	0.00	
27	656	34	0	0.00	0.00	
28	622	34	0	0.00	0.00	
29	588	34	250	0.00	250.00	
30	554	34	0	0.00	250.00	
31	770	34	0	250.00	250.00	
32	736	34	0	0.00	0.00	
33	702	34	250	0.00	250.00	
34	668	34	0	0.00	250.00	
35	884	34	0	250.00	250.00	
36	849	34	250	0.00	250.00	
37	815	34	0	0.00	250.00	
38	1031	34	0	250.00	250.00	
39	997	34	0	0.00	0.00	
40	963	34	250	0.00	250.00	
41	895	68	0	0.00	250.00	
42	1077	68	0	250.00	250.00	
43	1008	68	250	0.00	250.00	
44	940	68	0	0.00	250.00	
45	1122	68	0	250.00	250.00	

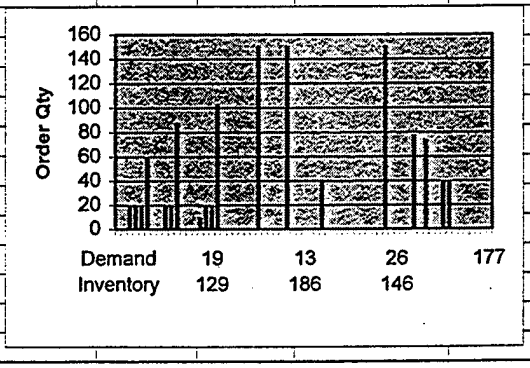
46	1054	68	0	0.00	0.00
47	986	68	0	0.00	0.00
48	917	68	0	0.00	0.00
49	849	68	0	0.00	0.00
50	781	68	250	0.00	250.00
51	678	103	0	0.00	250.00
52	826	103	0	250.00	250.00
53	723	103	0	0.00	0.00
54	621	103	0	0.00	0.00
55	518	103	0	0.00	0.00
56	415	103	45	0.00	44.80
57	313	103	103	0.00	147.40
58	255	103	103	44.80	250.00
59	255	103	0	102.60	205.20
60	255	103	0	102.60	102.60
Total Inv	36517				
Weight	1				
Obj	357				



APPENDIX L. DEFIBRILLATOR

			Safety Level 100		unit cost	$7,147
					Start Cost	$1,263,589.60
Day	Inventory	Demand	Order Qty	Receive	Throughput	
0	177					
1	158	19	19	0.00	0.00	
2	138	19	19	0.00	0.00	
3	119	19	19	0.00	0.00	
4	100	19	58	0.00	0.00	
5	100	19	0	19.20	115.20	
6	100	19	0	19.20	96.00	
7	100	19	19	19.20	96.00	
8	138	19	19	57.60	96.00	
9	119	19	87	0.00	125.20	
10	100	19	0	0.00	125.20	
11	100	19	0	19.20	125.20	
12	100	19	0	19.20	106.00	
13	168	19	9	86.80	96.00	
14	148	19	19	0.00	28.40	
15	129	19	19	0.00	47.60	
16	110	19	102	0.00	150.00	
17	100	19	0	9.20	150.00	
18	100	19	0	19.20	140.80	
19	100	19	0	19.20	121.60	
20	183	19	0	102.40	102.40	
21	164	19	0	0.00	0.00	
22	151	13	0	0.00	0.00	
23	138	13	150	0.00	150.00	
24	126	13	0	0.00	150.00	
25	113	13	0	0.00	150.00	
26	100	13	0	0.00	150.00	
27	237	13	0	150.00	150.00	
28	224	13	150	0.00	150.00	
29	212	13	0	0.00	150.00	
30	199	13	0	0.00	150.00	
31	186	13	0	0.00	150.00	
32	323	13	0	150.00	150.00	
33	310	13	0	0.00	0.00	
34	298	13	40	0.00	40.00	
35	285	13	0	0.00	40.00	
36	272	13	0	0.00	40.00	
37	259	13	0	0.00	40.00	
38	286	13	0	40.00	40.00	
39	274	13	0	0.00	0.00	
40	261	13	0	0.00	0.00	
41	248	13	0	0.00	0.00	
42	235	13	0	0.00	0.00	
43	222	13	0	0.00	0.00	
44	210	13	0	0.00	0.00	
45	197	13	150	0.00	150.00	

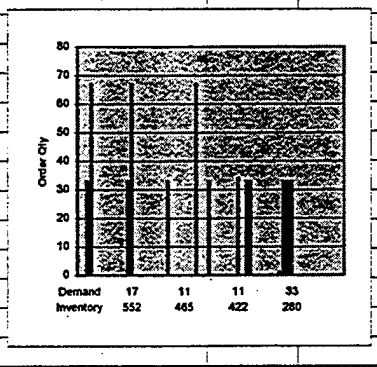
46	171	26	0	0.00	150.00
47	146	26	0	0.00	150.00
48	120	26	0	0.00	150.00
49	244	26	0	150.00	150.00
50	219	26	77	0.00	76.80
51	193	26	0	0.00	76.80
52	168	26	73	0.00	150.00
53	142	26	0	0.00	150.00
54	180	38	0	76.80	150.00
55	142	38	38	0.00	111.60
56	177	38	38	73.20	150.00
57	138	38	0	0.00	76.80
58	100	38	0	0.00	76.80
59	100	38	0	38.40	76.80
60	100	38	0	38.40	38.40
Total Inv	10282				
Weight	1				
Obj	177				



APPENDIX M. PUMPS 10

			Safety Level 83		Start Cost	$845,000.00
					Unit Cost	$1,300
Day	Inventory	Demand	Order Qty	Receive	Throughput	
0	650					
1	634	17	33	0.00	0.00	
2	617	17	67	0.00	0.00	
3	601	17	0	0.00	0.00	
4	584	17	0	0.00	0.00	
5	568	17	0	0.00	0.00	
6	551	17	0	0.00	0.00	
7	535	17	0	0.00	0.00	
8	518	17	0	0.00	0.00	
9	502	17	0	0.00	0.00	
10	518	17	0	33.00	100.00	
11	569	17	33	67.00	100.00	
12	552	17	67	0.00	100.00	
13	536	17	0	0.00	100.00	
14	519	17	0	0.00	100.00	
15	503	17	0	0.00	100.00	
16	486	17	0	0.00	100.00	
17	470	17	0	0.00	100.00	
18	453	17	0	0.00	100.00	
19	437	17	0	0.00	100.00	
20	453	17	0	33.00	100.00	
21	509	11	33	67.00	100.00	
22	498	11	0	0.00	33.00	
23	487	11	0	0.00	33.00	
24	476	11	0	0.00	33.00	
25	465	11	0	0.00	33.00	
26	454	11	0	0.00	33.00	
27	443	11	0	0.00	33.00	
28	432	11	67	0.00	100.00	
29	421	11	0	0.00	100.00	
30	443	11	0	33.00	100.00	
31	432	11	33	0.00	100.00	
32	421	11	0	0.00	100.00	
33	410	11	0	0.00	100.00	
34	399	11	0	0.00	100.00	
35	388	11	0	0.00	100.00	
36	377	11	0	0.00	100.00	
37	433	11	0	67.00	100.00	
38	422	11	34	0.00	67.00	
39	411	11	0	0.00	67.00	
40	433	11	33	33.00	100.00	
41	411	22	33	0.00	100.00	
42	389	22	0	0.00	100.00	
43	367	22	0	0.00	100.00	
44	345	22	0	0.00	100.00	
45	323	22	0	0.00	100.00	

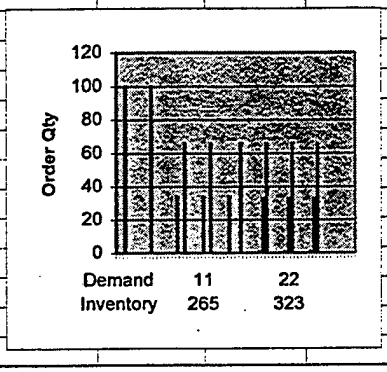
46	301	22	0	0.00	100.00
47	313	22	0	34.00	100.00
48	291	22	1	0.00	67.00
49	302	22	33	33.00	100.00
50	313	22	33	33.00	100.00
51	280	33	33	0.00	100.00
52	247	33	0	0.00	100.00
53	214	33	0	0.00	100.00
54	181	33	0	0.00	100.00
55	148	33	0	0.00	100.00
56	115	33	0	0.00	100.00
57	83	33	0	1.00	100.00
58	83	33	0	33.00	99.00
59	83	33	0	33.00	66.00
60	83	33	0	33.00	33.00
Total Inv	24227				
Weight	1				
Obj	650				



APPENDIX N. MS III INFUSION PUMPS 7 DAY LEAD TIME

			Safety Level 83		Start Cost	$497,900.00
					Unit Cost	$1,300
Day	Inventory	Demand	Order Qty	Receive	Throughput	
0	383					
1	366	17	100	0.00		
2	350	17	0	0.00		
3	333	17	0	0.00	0.00	
4	317	17	0	0.00	0.00	
5	300	17	0	0.00	0.00	
6	284	17	0	0.00	0.00	
7	367	17	0	100.00	100.00	
8	351	17	100	0.00	100.00	
9	334	17	0	0.00	100.00	
10	318	17	0	0.00	100.00	
11	301	17	0	0.00	100.00	
12	285	17	0	0.00	100.00	
13	268	17	0	0.00	100.00	
14	352	17	0	100.00	100.00	
15	335	17	34	0.00	34.00	
16	319	17	0	0.00	34.00	
17	302	17	66	0.00	100.00	
18	286	17	0	0.00	100.00	
19	269	17	0	0.00	100.00	
20	253	17	0	0.00	100.00	
21	276	11	0	34.00	100.00	
22	265	11	34	0.00	100.00	
23	320	11	0	66.00	100.00	
24	309	11	66	0.00	100.00	
25	298	11	0	0.00	100.00	
26	287	11	0	0.00	100.00	
27	276	11	0	0.00	100.00	
28	299	11	0	34.00	100.00	
29	288	11	34	0.00	100.00	
30	343	11	0	66.00	100.00	
31	332	11	0	0.00	34.00	
32	321	11	66	0.00	100.00	
33	310	11	0	0.00	100.00	
34	299	11	0	0.00	100.00	
35	322	11	0	34.00	100.00	
36	311	11	0	0.00	66.00	
37	300	11	1	0.00	67.00	
38	355	11	33	66.00	100.00	
39	344	11	66	0.00	100.00	
40	333	11	0	0.00	100.00	
41	311	22	0	0.00	100.00	
42	289	22	0	0.00	100.00	
43	268	22	0	1.00	100.00	
44	279	22	1	33.00	100.00	
45	323	22	33	66.00	100.00	

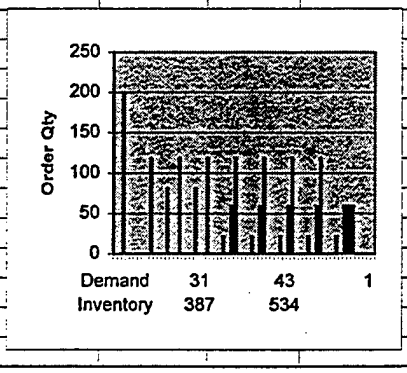
46	301	22	66	0.00	100.00
47	279	22	0	0.00	100.00
48	257	22	0	0.00	100.00
49	235	22	0	0.00	100.00
50	214	22	0	1.00	100.00
51	214	33	1	33.00	100.00
52	247	33	33	66.00	100.00
53	214	33	66	0.00	100.00
54	181	33	0	0.00	100.00
55	148	33	0	0.00	100.00
56	115	33	0	0.00	100.00
57	83	33	0	1.00	100.00
58	83	33	0	33.00	99.00
59	116	33	0	66.00	66.00
60	83	33	0	0.00	0.00
Total Inv	16723				
Weight	1				
Obj	383				



APPENDIX O. CENTRAL INTERMITTENT PROTABLE SUCTION UNIT (CISU) 8 DAY LEAD TIME

			Safety Level 153		Start Cost	$327,319.20
					Unit Cost	$676
Day	Inventory	Demand	Order Qty	Receive	Throughput	
0	484					
1	453	31	200	0.00		
2	423	31	0	0.00		
3	392	31	0	0.00	0.00	
4	361	31	0	0.00	0.00	
5	330	31	0	0.00	0.00	
6	299	31	0	0.00	0.00	
7	469	31	0	200.00	200.00	
8	438	31	119	0.00	118.80	
9	407	31	0	0.00	118.80	
10	495	31	0	118.80	118.80	
11	464	31	0	0.00	118.80	
12	433	31	81	0.00	200.00	
13	403	31	0	0.00	200.00	
14	453	31	0	81.20	200.00	
15	422	31	119	0.00	200.00	
16	391	31	0	0.00	200.00	
17	479	31	0	118.80	200.00	
18	449	31	0	0.00	200.00	
19	418	31	81	0.00	200.00	
20	387	31	0	0.00	200.00	
21	448	21	0	81.20	200.00	
22	427	21	119	0.00	200.00	
23	407	21	0	0.00	200.00	
24	505	21	0	118.80	200.00	
25	485	21	0	0.00	200.00	
26	464	21	22	0.00	140.60	
27	444	21	0	0.00	140.60	
28	445	21	59	21.80	200.00	
29	424	21	119	0.00	200.00	
30	463	21	0	59.40	200.00	
31	562	21	0	118.80	200.00	
32	541	21	0	0.00	200.00	
33	521	21	22	0.00	200.00	
34	500	21	0	0.00	200.00	
35	501	21	59	21.80	200.00	
36	481	21	119	0.00	200.00	
37	520	21	0	59.40	200.00	
38	618	21	0	118.80	200.00	
39	598	21	0	0.00	200.00	
40	577	21	22	0.00	200.00	
41	534	43	0	0.00	200.00	
42	513	43	59	21.80	200.00	
43	470	43	119	0.00	200.00	
44	486	43	0	59.40	200.00	
45	562	43	0	118.80	200.00	

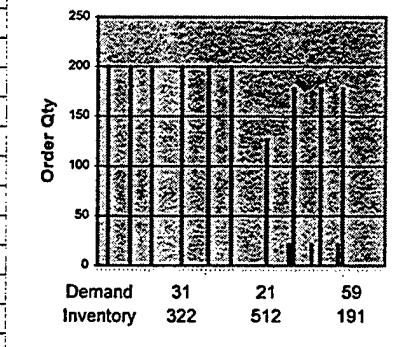
46	519	43	0	0.00	200.00	
47	476	43	22	0.00	200.00	
48	433	43	0	0.00	200.00	
49	412	43	59	21.80	200.00	
50	369	43	119	0.00	200.00	
51	369	59	0	59.40	200.00	
52	428	59	0	118.80	200.00	
53	369	59	0	0.00	200.00	
54	309	59	22	0.00	200.00	
55	250	59	0	0.00	200.00	
56	212	59	59	21.80	200.00	
57	153	59	59	0.00	140.60	
58	153	59	59	59.40	200.00	
59	153	59	0	59.40	200.00	
60	153	59	0	59.40	200.00	
Total Inv	25618					
Weight	1					
Obj	484					



APPENDIX P. CISU
6 DAY LEAD TIME

			safety Level 153		Start Cost	186711.2
					Unit Cost	$676
Day	Inventory	Demand	Order Qty	Receive	Tput	
0	276					
1	245	31	200	0.00		
2	215	31	0	0.00		
3	184	31	0	0.00	0.00	
4	153	31	0	0.00	0.00	
5	322	31	0	200.00	200.00	
6	291	31	200	0.00	200.00	
7	261	31	0	0.00	200.00	
8	230	31	0	0.00	200.00	
9	199	31	0	0.00	200.00	
10	368	31	0	200.00	200.00	
11	337	31	200	0.00	200.00	
12	307	31	0	0.00	200.00	
13	276	31	0	0.00	200.00	
14	245	31	0	0.00	200.00	
15	414	31	0	200.00	200.00	
16	383	31	0	0.00	0.00	
17	353	31	0	0.00	0.00	
18	322	31	200	0.00	200.00	
19	291	31	0	0.00	200.00	
20	260	31	0	0.00	200.00	
21	240	21	0	0.00	200.00	
22	419	21	0	200.00	200.00	
23	399	21	0	0.00	0.00	
24	378	21	200	0.00	200.00	
25	358	21	0	0.00	200.00	
26	337	21	0	0.00	200.00	
27	317	21	0	0.00	200.00	
28	496	21	0	200.00	200.00	
29	476	21	200	0.00	200.00	
30	455	21	0	0.00	200.00	
31	435	21	0	0.00	200.00	
32	414	21	0	0.00	200.00	
33	594	21	0	200.00	200.00	
34	573	21	0	0.00	0.00	
35	553	21	0	0.00	0.00	
36	532	21	0	0.00	0.00	
37	512	21	127	0.00	126.80	
38	491	21	0	0.00	126.80	
39	471	21	0	0.00	126.80	
40	450	21	0	0.00	126.80	
41	534	43	0	126.80	126.80	
42	491	43	22	0.00	21.80	
43	448	43	178	0.00	200.00	
44	405	43	0	0.00	200.00	
45	362	43	0	0.00	200.00	

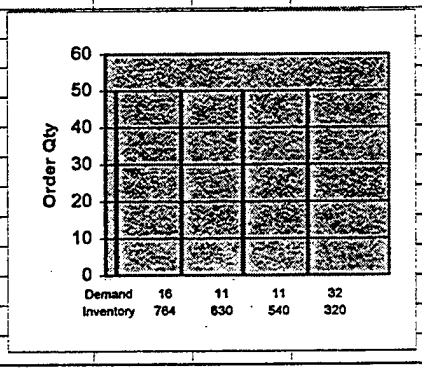
46	341	43	0	21.80	200.00
47	476	43	22	178.20	200.00
48	433	43	0	0.00	21.80
49	390	43	178	0.00	200.00
50	347	43	0	0.00	200.00
51	309	59	0	21.80	200.00
52	250	59	0	0.00	178.20
53	369	59	22	178.20	200.00
54	309	59	178	0.00	200.00
55	250	59	0	0.00	200.00
56	191	59	0	0.00	200.00
57	153	59	0	21.80	200.00
58	272	59	0	178.20	178.20
59	212	59	0	0.00	0.00
60	153	59	0	0.00	0.00
Total Inv	21250				
Weight	1				
Obj	276				



APPENDIX Q. VENTILATOR 754M
14 DAY LEAD TIME

			Safety Level 80		Start Cost	$7,664,000.00
					Unit Cost	$8,000
Day	Inventory	Demand	Order Qty	Receive	Throughput	
0	958					
1	942	16	50	0.00		
2	926	16	0	0.00		
3	909	16	0	0.00	0.00	
4	893	16	0	0.00	0.00	
5	877	16	0	0.00	0.00	
6	861	16	0	0.00	0.00	
7	845	16	0	0.00	0.00	
8	828	16	0	0.00	0.00	
9	812	16	0	0.00	0.00	
10	796	16	0	0.00	0.00	
11	780	16	0	0.00	0.00	
12	764	16	0	0.00	0.00	
13	747	16	0	0.00	0.00	
14	781	16	0	50.00	50.00	
15	765	16	0	0.00	0.00	
16	749	16	50	0.00	50.00	
17	733	16	0	0.00	50.00	
18	716	16	0	0.00	50.00	
19	700	16	0	0.00	50.00	
20	684	16	0	0.00	50.00	
21	673	11	0	0.00	50.00	
22	662	11	0	0.00	50.00	
23	652	11	0	0.00	50.00	
24	641	11	0	0.00	50.00	
25	630	11	0	0.00	50.00	
26	619	11	0	0.00	50.00	
27	608	11	0	0.00	50.00	
28	598	11	0	0.00	50.00	
29	637	11	0	50.00	50.00	
30	626	11	50	0.00	50.00	
31	615	11	0	0.00	50.00	
32	604	11	0	0.00	50.00	
33	594	11	0	0.00	50.00	
34	583	11	0	0.00	50.00	
35	572	11	0	0.00	50.00	
36	561	11	0	0.00	50.00	
37	550	11	0	0.00	50.00	
38	540	11	0	0.00	50.00	
39	529	11	0	0.00	50.00	
40	518	11	0	0.00	50.00	
41	496	22	0	0.00	50.00	
42	475	22	0	0.00	50.00	
43	503	22	0	50.00	50.00	
44	482	22	0	0.00	0.00	
45	460	22	50	0.00	50.00	

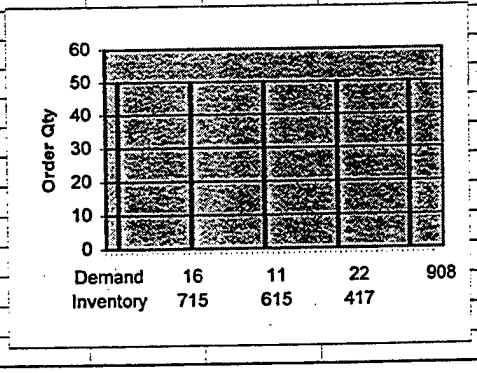
46	438	22	0	0.00	50.00	
47	417	22	0	0.00	50.00	
48	395	22	0	0.00	50.00	
49	374	22	0	0.00	50.00	
50	352	22	0	0.00	50.00	
51	320	32	0	0.00	50.00	
52	288	32	0	0.00	50.00	
53	255	32	0	0.00	50.00	
54	223	32	0	0.00	50.00	
55	191	32	0	0.00	50.00	
56	159	32	0	0.00	50.00	
57	127	32	0	0.00	50.00	
58	144	32	0	50.00	50.00	
59	112	32	0	0.00	0.00	
60	80	32	0	0.00	0.00	
Total Inv	34411					
Weight	1					
Obj	958					



APPENDIX R. VENTILATOR 754M 10 DAY LEAD TIME

			Safety Level 80		Start Cost	7264000
					Unit Cost	$8,000
Day	Inventory	Demand	Order qty	Receive	Throughput	
0	908					
1	892	16	50	0.00		
2	876	16	0	0.00		
3	909	16	0	50.00	0.00	
4	893	16	0	0.00	0.00	
5	877	16	0	0.00	0.00	
6	861	16	0	0.00	0.00	
7	845	16	0	0.00	50.00	
8	828	16	0	0.00	0.00	
9	812	16	0	0.00	0.00	
10	796	16	0	0.00	0.00	
11	780	16	0	0.00	0.00	
12	764	16	0	0.00	0.00	
13	747	16	0	0.00	0.00	
14	731	16	0	0.00	50.00	
15	715	16	50	0.00	50.00	
16	699	16	0	0.00	50.00	
17	733	16	0	50.00	50.00	
18	716	16	0	0.00	50.00	
19	700	16	0	0.00	50.00	
20	684	16	0	0.00	50.00	
21	673	11	0	0.00	50.00	
22	662	11	0	0.00	50.00	
23	652	11	0	0.00	50.00	
24	641	11	0	0.00	50.00	
25	630	11	0	0.00	50.00	
26	619	11	0	0.00	50.00	
27	608	11	0	0.00	50.00	
28	598	11	0	0.00	50.00	
29	587	11	50	0.00	50.00	
30	576	11	0	0.00	50.00	
31	615	11	0	50.00	50.00	
32	604	11	0	0.00	50.00	
33	594	11	0	0.00	50.00	
34	583	11	0	0.00	50.00	
35	572	11	0	0.00	50.00	
36	561	11	0	0.00	50.00	
37	550	11	0	0.00	50.00	
38	540	11	0	0.00	50.00	
39	529	11	0	0.00	50.00	
40	518	11	0	0.00	50.00	
41	496	22	0	0.00	50.00	
42	475	22	0	0.00	50.00	
43	453	22	50	0.00	50.00	
44	432	22	0	0.00	50.00	
45	460	22	0	50.00	50.00	

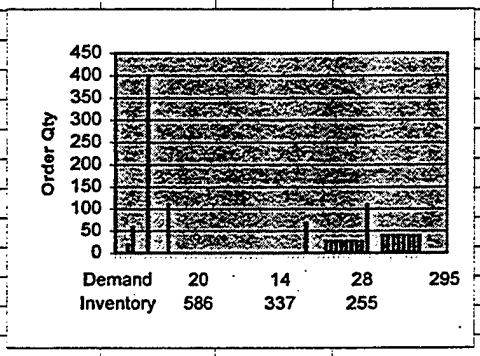
46	438	22	0	0.00	50.00
47	417	22	0	0.00	50.00
48	395	22	0	0.00	50.00
49	374	22	0	0.00	50.00
50	352	22	0	0.00	50.00
51	320	32	0	0.00	50.00
52	288	32	0	0.00	50.00
53	255	32	0	0.00	50.00
54	223	32	0	0.00	50.00
55	191	32	0	0.00	50.00
56	159	32	0	0.00	50.00
57	127	32	50	0.00	50.00
58	94	32	0	0.00	50.00
59	112	32	0	50.00	50.00
60	80	32	0	0.00	50.00
Total Inv	33911				
Weight	1				
Obj	908				



APPENDIX S. OXYGEN ANALYZER MINIOX 3000 3 DAY LEAD TIME

			Safety Level 255		Start Cost	$173,165
					Unit Cost	$587
Day	Inventory	Demand	Order qty	Receive	Throughput	
0	295					
1	275	20	20	0.00		
2	255	20	60	0.00		
3	255	20	0	20.00	80.00	
4	295	20	0	60.00	60.00	
5	275	20	400	0.00	400.00	
6	255	20	0	0.00	400.00	
7	635	20	0	400.00	400.00	
8	615	20	0	0.00	0.00	
9	595	20	111	0.00	111.20	
10	575	20	0	0.00	111.20	
11	666	20	0	111.20	111.20	
12	646	20	0	0.00	0.00	
13	626	20	0	0.00	0.00	
14	606	20	0	0.00	0.00	
15	586	20	0	0.00	0.00	
16	566	20	0	0.00	0.00	
17	546	20	0	0.00	0.00	
18	526	20	0	0.00	0.00	
19	506	20	0	0.00	0.00	
20	486	20	0	0.00	0.00	
21	473	14	0	0.00	0.00	
22	459	14	0	0.00	0.00	
23	445	14	0	0.00	0.00	
24	432	14	0	0.00	0.00	
25	418	14	0	0.00	0.00	
26	405	14	0	0.00	0.00	
27	391	14	0	0.00	0.00	
28	377	14	0	0.00	0.00	
29	364	14	0	0.00	0.00	
30	350	14	0	0.00	0.00	
31	337	14	0	0.00	0.00	
32	323	14	0	0.00	0.00	
33	309	14	0	0.00	0.00	
34	296	14	0	0.00	0.00	
35	282	14	0	0.00	0.00	
36	269	14	68	0.00	68.30	
37	255	14	0	0.00	68.30	
38	310	14	0	68.30	68.30	
39	296	14	0	0.00	0.00	
40	282	14	28	0.00	27.50	
41	255	28	27	0.00	55.00	
42	255	28	27	27.50	82.50	
43	255	28	28	27.50	82.50	
44	255	28	27	27.50	82.50	
45	255	28	27	27.50	82.50	

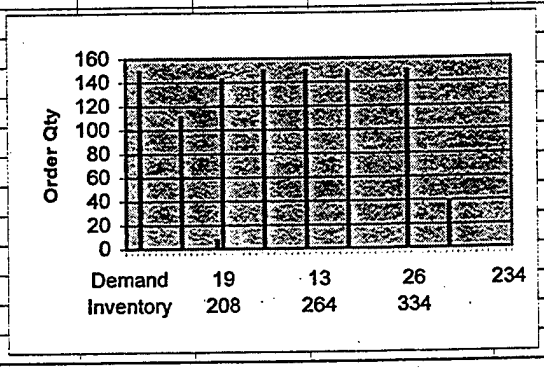
46	255	28	27	27.50	82.50
47	255	28	27	27.50	82.50
48	255	28	110	27.50	164.90
49	255	28	0	27.50	137.40
50	337	28	0	109.90	109.90
51	296	41	41	0.00	41.20
52	255	41	41	0.00	82.40
53	255	41	41	41.20	123.60
54	255	41	41	41.20	123.60
55	255	41	41	41.20	123.60
56	255	41	41	41.20	123.60
57	255	41	41	41.20	123.60
58	255	41	41	41.20	123.60
59	255	41	0	41.20	82.40
60	255	41	0	41.20	41.20
Total Inv	22088				
Weight	1				
Obj	295				



APPENDIX T. PULSE OXIMETER BCI 3303 3 DAY LEAD TIME

			Safety Level 100		unit cost	$1,365
					Start Cost	$319,956.00
Day	Inventory	Demand	Order Qty	Receive	Throughput	
0	234					
1	215	19	150	0.00	150.00	
2	196	19	0	0.00	150.00	
3	177	19	0	0.00	150.00	
4	158	19	0	0.00	150.00	
5	138	19	0	0.00	150.00	
6	119	19	0	0.00	150.00	
7	100	19	0	0.00	150.00	
8	231	19	111	150.00	111.20	
9	212	19	0	0.00	111.20	
10	192	19	0	0.00	111.20	
11	173	19	0	0.00	111.20	
12	154	19	0	0.00	111.20	
13	135	19	0	0.00	111.20	
14	116	19	8	0.00	118.80	
15	208	19	142	111.20	150.00	
16	188	19	0	0.00	150.00	
17	169	19	0	0.00	150.00	
18	150	19	0	0.00	150.00	
19	131	19	0	0.00	150.00	
20	112	19	0	0.00	150.00	
21	100	19	0	7.60	142.40	
22	230	13	150	142.40	150.00	
23	217	13	0	0.00	150.00	
24	204	13	0	0.00	150.00	
25	191	13	0	0.00	150.00	
26	178	13	0	0.00	150.00	
27	166	13	0	0.00	150.00	
28	153	13	0	0.00	150.00	
29	290	13	150	150.00	150.00	
30	277	13	0	0.00	150.00	
31	264	13	0	0.00	150.00	
32	252	13	0	0.00	150.00	
33	239	13	0	0.00	150.00	
34	226	13	0	0.00	150.00	
35	213	13	0	0.00	150.00	
36	350	13	150	150.00	150.00	
37	338	13	0	0.00	150.00	
38	325	13	0	0.00	150.00	
39	312	13	0	0.00	150.00	
40	299	13	0	0.00	150.00	
41	286	13	0	0.00	150.00	
42	274	13	0	0.00	150.00	
43	411	13	0	150.00	0.00	
44	398	13	0	0.00	0.00	
45	385	13	0	0.00	0.00	

46	360	26	150	0.00	150.00
47	334	26	0	0.00	150.00
48	308	26	0	0.00	150.00
49	283	26	0	0.00	150.00
50	257	26	0	0.00	150.00
51	232	26	0	0.00	150.00
52	206	26	0	0.00	150.00
53	330	26	38	150.00	38.40
54	292	38	0	0.00	38.40
55	254	38	0	0.00	38.40
56	215	38	0	0.00	38.40
57	177	38	0	0.00	38.40
58	138	38	0	0.00	38.40
59	100	38	0	0.00	38.40
60	100	38	0	38.40	0.00
Total Inv	13437				
Weight	1				
Obj	234				



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